HISTORY INFORMATION FOR THE FOLLOWING MANUAL:

SERVICE MANUAL

BA-6 CHASSIS

MODEL NAME	REMOTE COMMANDER	DESTINATION	CHASSIS NO.
KV-20FS120	RM-Y194	US	SCC- S61K-A
KV-20FS120	RM-Y194	CND	SCC- S59H-A
KV-21FM120	RM-W151	LATIN NORTH	SCC- S60X-A
KV-21FS120	RM-Y194	LATIN NORTH	SCC- S60Y-A
KV-21FS120	RM-Y194	LATIN SOUTH	SCC- S73A-A
KV-21FA310	RM-Y180	LATIN NORTH	SCC- S60T-A
KV-21FA310	RM-Y180	LATIN SOUTH	SCC- S60U-A
KV-24FS120	RM-Y194	US	SCC- S61L-A
KV-24FS120	RM-Y194	CND	SCC- S59J-A
KV-25FS120	RM-Y194	LATIN NORTH	SCC- S73B-A
KV-25FS120	RM-Y194	LATIN SOUTH	SCC- S73C-A

ORIGINAL MANUAL ISSUE DATE: 3/2004

REVISION DATE	SUBJECT
3/2004	No revisions or updates are applicable at this time.

TRINITRON® COLOR TELEVISION

SONY®

9-965-959-01

Self Diagnosis Supported model

SERVICE MANUAL

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KV-21FS120	RM-Y194	LATIN NORTH	SCC- S60Y-A
KV-21FS120	RM-Y194	LATIN SOUTH	SCC- S73A-A
KV-21FA310	RM-Y180	LATIN NORTH	SCC- S60T-A
KV-21FA310	RM-Y180	LATIN SOUTH	SCC- S60U-A
KV-24FS120	RM-Y194	US	SCC- S61L-A
KV-24FS120	RM-Y194	CND	SCC- S59J-A
KV-25FS120	RM-Y194	LATIN NORTH	SCC- S73B-A
KV-25FS120	RM-Y194	LATIN SOUTH	SCC- S73C-A

KV-24FS120

KV-21FA310

TRINITRON® COLOR TELEVISION

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9-965-959-01

TABLE OF CONTENTS

SECTION TITLE **PAGE**

Specifications 4
Warnings and Cautions 6
Safety Check-Out 7
Self-Diagnostic Function 8

SECTION 1: DISASSEMBLY 10
1-1. Rear Cover Removal (All Except KV-21FA310) 10
1-2. Rear Cover Removal (KV-21FA310 Only) 10
1-3. Chassis Assembly Removal 11
1-4. Service Position 11
1-5. Picture Tube Removal 12
Anode Cap Removal Procedure 12

SECTION 2: SET-UP ADJUSTMENTS 13
2-1. Beam Landing 13
2-2. Convergence 14
2-3. Focus 15
2-4. Screen (G2) 16
2-5. Method of Setting the Service Adjustment Mode 16
2-6. White Balance Adjustments 16

SECTION 3: SAFETY RELATED ADJUSTMENTS 17
3-1. ⋈ R565 Confirmation Method (HV Hold-Down Confirmation) and Readjustments 17
3-2. B+ Voltage Confirmation and Adjustment 17

SECTION 4: CIRCUIT ADJUSTMENTS 19
4-1. Setting the Service Adjustment Mode 19
4-2. Memory Write Confirmation Method 19
4-3. Remote Adjustment Buttons and Indicators 19
4-4. Service Data Lists 20
4-5. ID Map Table 34
4-6. A Board Adjustments 34

SECTION 5: DIAGRAMS 37
5-1. Circuit Boards Location 37
5-2. Printed Wiring Board and Schematic Diagram Information 37
5-3. Block Diagram and Schematics 38
A Board Schematic Diagram 39
HB Board Schematic Diagram (All Except KV-21FA310) 41
HR Board Schematic Diagram (KV-21FA310 Only) 44
CV Board Schematic Diagram 45
K Board Schematic Diagram (KV-21FA310 Only) 49
5-4. Semiconductors 51

SECTION 6: EXPLODED VIEWS 52
6-1. Picture Tube (KV-20FS120/21FS120 Only) 52
6-2. Chassis (KV-20FS120/21FS120 Only) 53
6-3. Picture Tube (KV-21FM120 Only) 54
6-4. Chassis (KV-21FM120 Only) 55
6-5. Picture Tube (KV-21FA310 Only) 56
6-6. Chassis (KV-21FA310 Only) 57
6-7. Picture Tube (KV-24FS120/25FS120 Only) 58
6-8. Chassis (KV-24FS120/25FS120 Only) 59

SECTION 7: ELECTRICAL PARTS LIST 60

SPECIFICATIONS

	KV-20FS120	KV-21FM120	KV-21FS120 (N)	KV-21FS120 (S)
Power Requirements	120V, 60Hz	120V, 60Hz	120V, 60Hz	220V, 50/60Hz
Number of Inputs/Outputs				
Video [1]	2	2	2	2
S Video [2]	0	0	0	0
Y,P_B, P_R [3]	1	0	1	1
Audio [4]	4	2	4	4
Audio Out [5]	0	0	0	0
Speaker Output (W)	10W x 2	5W x 2	10W x 2	10W x 2
Headphones	1	1	1	1
Power Consumption (W)				
In Use (Max)	140W	125W	140W	135W
In Standby (Max) [6]	1W	1W	1W	1W
Dimensions (W x H x D)				
mm	631 x 468 x 490.5 mm	631 x 468 x 490.5 mm	631 x 468 x 490.5 mm	631 x 468 x 490.5 mm
in	24 7/8 x 18 3/8 x 19 1/4 in	24 7/8 x 18 3/8 x 19 1/4 in	24 7/8 x 18 3/8 x 19 1/4 in	24 7/8 x 18 3/8 x 19 1/4 in
Mass				
kg	25.2 kg	25.2 kg	25.2 kg	25.2 kg
lbs	55 lbs 9 oz	55 lbs 9 oz	55 lbs 9 oz	55 lbs 9 oz

	KV-21FA310 (N)	KV-21FA310 (S)	KV-24FS120 KV-25FS10 (N)	KV-25FS120 (S)
Power Requirements	120V, 60Hz	220V, 50/60Hz	120V, 60Hz	220V, 50/60Hz
Number of Inputs/Outputs				
Video [1]	2	2	2	2
S Video [2]	1	1	1	1
Y,P_B, P_R [3]	1	1	1	1
Audio [4]	4	4	4	4
Audio Out [5]	1	1	1	1
Speaker Output (W)	5W x 3	5W x 3	10W x 2	10W x 2
Subwoofer	15W	15W	NA	NA
Headphones	1	1	1	1
Power Consumption (W)				
In Use (Max)	155W	150W	165W	160W
In Standby (Max) [6]	1W	1W	1W	1W
Dimensions (W x H x D)				
mm	609 x 540 x 503 mm	609 x 540 x 503 mm	718 x 526.5 x 480 mm	718 x 526.5 x 480 mm
in	24 x 21 1/4 x 19 3/4 in	24 x 21 1/4 x 19 3/4 in	28 1/4 x 20 3/4 x 18 7/8 in	28 1/4 x 20 3/4 x 18 7/8 in
Mass				
kg	28.6 kg	28.6 kg	32.8 kg	32.8 kg
lbs	63 lbs	63 lbs	72 lbs 5 oz	72 lbs 5 oz

1) 1 Vp-p 75 ohms unbalanced, sync negative
2) Y: 1 Vp-p 75 ohms unbalanced, sync negative
   C: 0.286 Vp-p (Burst signal), 75 ohms
3) Y: 1.0 Vp-p, 75 ohms unbalanced, sync negative;
   P_B: 0.7 Vp-p, 75 ohms
   P_R: 0.7 Vp-p, 75 ohms
4) 500 mVrms (100% modulation), Impedance: 47 kilohms
5) More than 408 mVrms at the maximum volume setting (variable)
   More than 408 mVrms (fix); Impedance (output): 2 kilohms
6) This specification is maximum wattage.

Television system
American TV standard, NTSC

Channel coverage
VHF: 2-13/ UHF: 14-69/ CATV: 1-125

Picture tube
FD Trinitron® tube

Visible screen size
20-inch picture measured diagonally
(KV-20FS120/21FM120/21FS120/21FA310 Only)
24-inch picture measured diagonally
(KV-24FS120/25FS120 Only)

Actual screen size
21-inch measured diagonally
(KV-20FS120/21FM120/21FS120/21FA310 Only)
25-inch measured diagonally
(KV-24FS120/25FS120 Only)

Antenna
75 ohm external terminal for VHF/UHF

Supplied Accessories
Remote Commander RM-Y194
(KV-20FS120/21FS120/24FS120/25FS120 Only)
Remote Commander RM-W151
(KV-21FM120 Only)
Remote Commander RM-Y180
(KV-21FA310 Only)
Two Size AA (R6) Batteries
Antenna, Telescopic
(KV-21FM120/21FS120/21FA310/25FS120 Only)

TruSurround™ by SRS (●)®

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WARNINGS AND CAUTIONS

CAUTION

Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield, or carbon painted on the CRT, after removing the anode.

WARNING!!

An isolation transformer should be used during any service to avoid possible shock hazard, because of live chassis. The chassis of this receiver is directly connected to the ac power line.

⚠ SAFETY-RELATED COMPONENT WARNING!!

Components identified by shading and ⚠ mark on the schematic diagrams, exploded views, and in the parts list are critical for safe operation. Replace these components with Sony parts whose part numbers appear as shown in this manual or in supplements published by Sony. Circuit adjustments that are critical for safe operation are identified in this manual. Follow these procedures whenever critical components are replaced or improper operation is suspected.

ATTENTION!!

Apres avoir deconnecte le cap de l'anode, court-circuiter l'anode du tube cathodique et celui de l'anode du cap au chassis metallique de l'appareil, ou la couche de carbone peinte sur le tube cathodique ou au blindage du tube cathodique.

Afin d'eviter tout risque d'electrocution provenant d'un châssis sous tension, un transformateur d'isolement doit etre utilisé lors de tout dépannage. Le châssis de ce récepteur est directement raccordé à l'alimentation du secteur.

⚠ ATTENTION AUX COMPOSANTS RELATIFS A LA SECURITE!!

Les composants identifies par une trame et par une marque ⚠ sur les schemas de principe, les vues explosees et les listes de pieces sont d'une importance critique pour la securite du fonctionnement. Ne les remplacer que par des composants Sony dont le numero de piece est indique dans le present manuel ou dans des supplements publies par Sony. Les reglages de circuit dont l'importance est critique pour la securite du fonctionnement sont identifies dans le present manuel. Suivre ces procedures lors de chaque remplacement de composants critiques, ou lorsqu'un mauvais fonctionnement suspecte.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly soldered connections. Check the entire board surface for solder splashes and bridges.

2. Check the interboard wiring to ensure that no wires are “pinched” or touching high-wattage resistors.

3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.

4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.

5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.

6. Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.

7. Check the B+ and HV to see if they are specified values. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.

8. Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

Leakage Test

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instructions.

2. A battery-operated AC milliampmeter. The Data Precision 245 digital multimeter is suitable for this job.

3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low voltage scale. The Simpson’s 250 and Sanwa SH-63TRD are examples of passive VOMs that are suitable. Nearly all battery-operated digital multimeters that have a 2 VAC range are suitable (see Figure A).

How to Find a Good Earth Ground

A cold-water pipe is a guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms.

If a cold-water pipe is not accessible, connect a 60- to 100-watt trouble- light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side on the line; the lamp should light at normal brilliance if the screw is at ground potential (see Figure B).

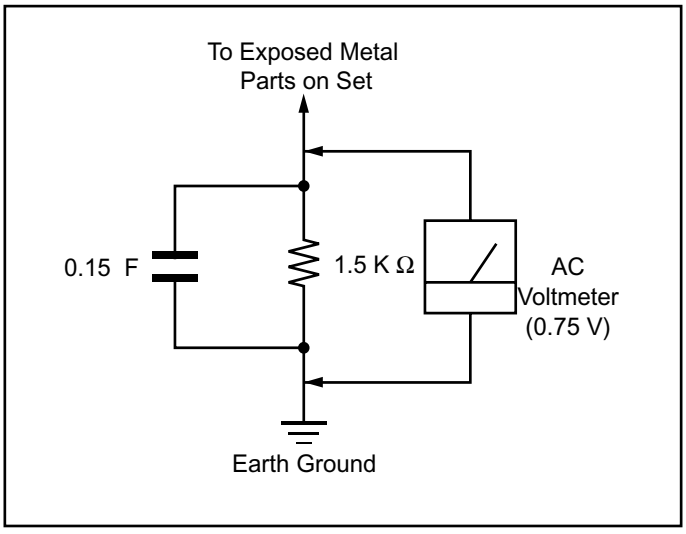


Figure A. Using an AC voltmeter to check AC leakage.

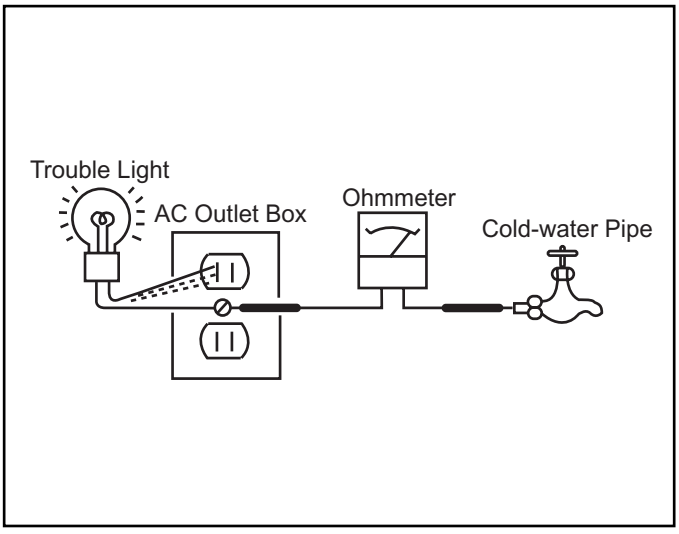


Figure B. Checking for earth ground.

SELF-DIAGNOSTIC FUNCTION

Self Diagnosis Supported model

The units in this manual contain a self-diagnostic function. If an error occurs, the STANDBY/TIMER LED will automatically begin to flash. The number of times the LED flashes translates to a probable source of the problem. A definition of the STANDBY/TIMER LED flash indicators is listed in the instruction manual for the user's knowledge and reference. If an error symptom cannot be reproduced, the Remote Commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

Diagnostic Test Indicators

When an error occurs, the STANDBY/TIMER LED will flash a set number of times to indicate the possible cause of the problem. If there is more than one error, the LED will identify the first of the problem areas.

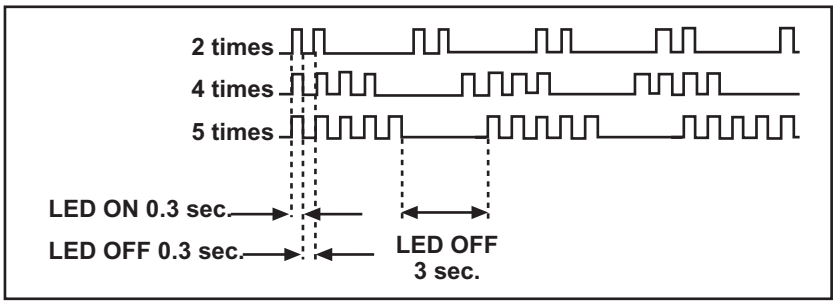
Results for all of the following diagnostic items are displayed on screen. No error has occurred if the screen displays a "0".

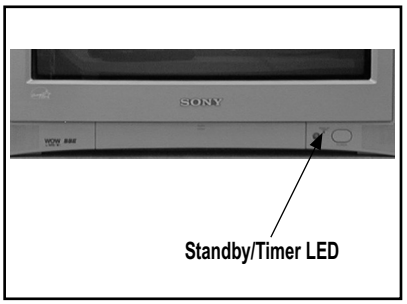
Diagnostic Item Description	No. of times STANDBY/ TIMER lamp flashes	Self-Diagnositc Display/ Diagnostic Result	Probable Cause Location	Detected Symptoms
Power does not turn on	Does not light	————	• Power cord is not plugged in. • Fuse is burned out (F601). (A Board)	• Power does not come on. • No power is supplied to the TV. • AC Power supply is faulty.
+B overcurrent (OCP)*	2 times	2:0 or 2:1	• H.OUT (Q506) is shorted. (A Board) (20"/21" models only) H.OUT (Q505) is shorted. (A Board) (24"/25" models only) •RGB Amp (IC1751) is shorted. (CV Board)	• Power does not come on. • Load on power line is shorted.
I-Prot	4 times	4:0 or 4:1	• +13V is not supplied. (A Board) • IC545 is faulty. (A Board)	• Has entered standby state after horizontal raster. • Vertical deflection pulse is stopped. • Power line is shorted or power supply is stopped.
IK (AKB)	5 times	5:0 or 5:1	• Video OUT (IC545) is faulty. (A Board) • IC001 is faulty. (A Board) • Screen (G2) is improperly adjusted.**	• No raster is generated. • CRT Cathode current detection reference pulse output is small.

*If a +B overcurrent is detected, stoppage of the vertical deflection is detected simultaneously. The symptom that is diagnosed first by the mircrocontroller is displayed on the screen.

**Refer to Screen (G2) Adjustments in Section 2-4. of this manual.

Display of Standby/Timer LED Flash Count





Diagnostic Item	Flash Count*
+B Overcurrent	2 times
I-Prot	4 times
IK (AKB)	5 times

*One flash count is not used for self-diagnostic.

Stopping the Standby/Timer LED Flash

Turn off the power switch on the TV main unit or unplug the power cord from the outlet to stop the STANDBY/TIMER LAMP from flashing.

Self-Diagnostic Screen Display

For errors with symptoms such as “power sometimes shuts off” or “screen sometimes goes out” that cannot be confirmed, it is possible to bring up past occurrences of failure on the screen for confirmation.

To Bring Up Screen Test

In standby mode, press buttons on the Remote Commander sequentially, in rapid succession, as shown below:

Display ➡ Channel 5 ➡ Sound Volume - ➡ Power ON

⇧ Note that this differs from entering the Service Mode (Sound Volume +).

Self-Diagnostic Screen Display

SELF DIAGNOSTIC		
2:	+B OCP	0
3:	+B OVP	N/A
4:	VSTOP	0
5:	AKB	1
101:	WDT	N/A

Numeral “0” means that no fault was detected.

Numeral “1” means a fault was detected one time only.

Handling of Self-Diagnostic Screen Display

Since the diagnostic results displayed on the screen are not automatically cleared, always check the self-diagnostic screen during repairs. When you have completed the repairs, clear the result display to “0”.

Unless the result display is cleared to “0”, the self-diagnostic function will not be able to detect subsequent faults after completion of the repairs.

Clearing the Result Display

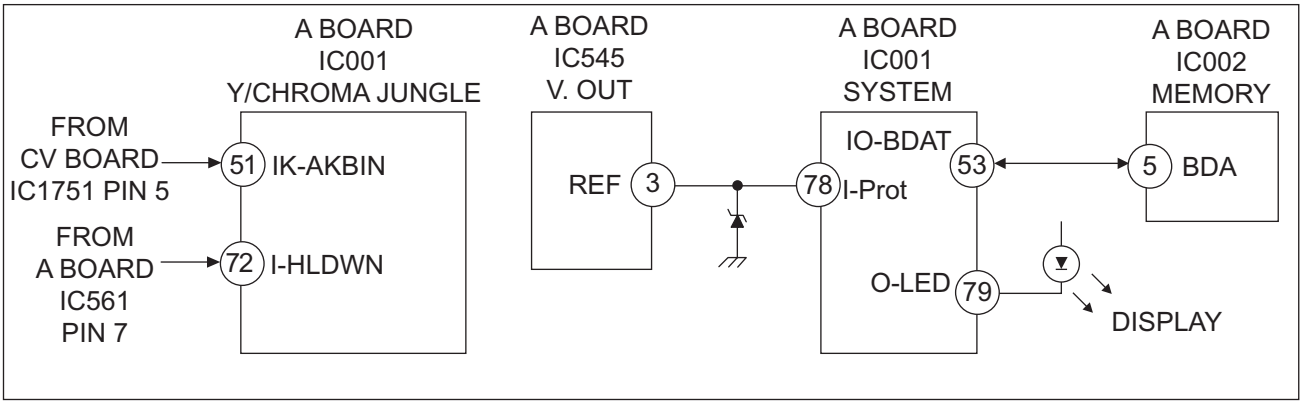
To clear the result display to “0”, press buttons on the Remote Commander sequentially when the diagnostic screen is displayed, as shown below:

Channel 8 ➡ ENTER

Quitting the Self-Diagnostic Screen

To quit the entire self-diagnostic screen, turn off the power switch on the Remote Commander or the main unit.

Self-Diagnostic Circuit



+B overcurrent (OCP)

Occurs when an overcurrent on the +B (135V) line is detected by pin 72 of IC001 (A Board). If the voltage of pin 72 of IC001 (A Board) is less than 1V when V.SYNC is more than seven verticals in a period, the unit will automatically turn off.

I-Prot

Occurs when an absence of the vertical deflection pulse is detected by pin 78 of IC001 (A Board). Power supply will shut down when waveform interval exceeds 2 seconds.

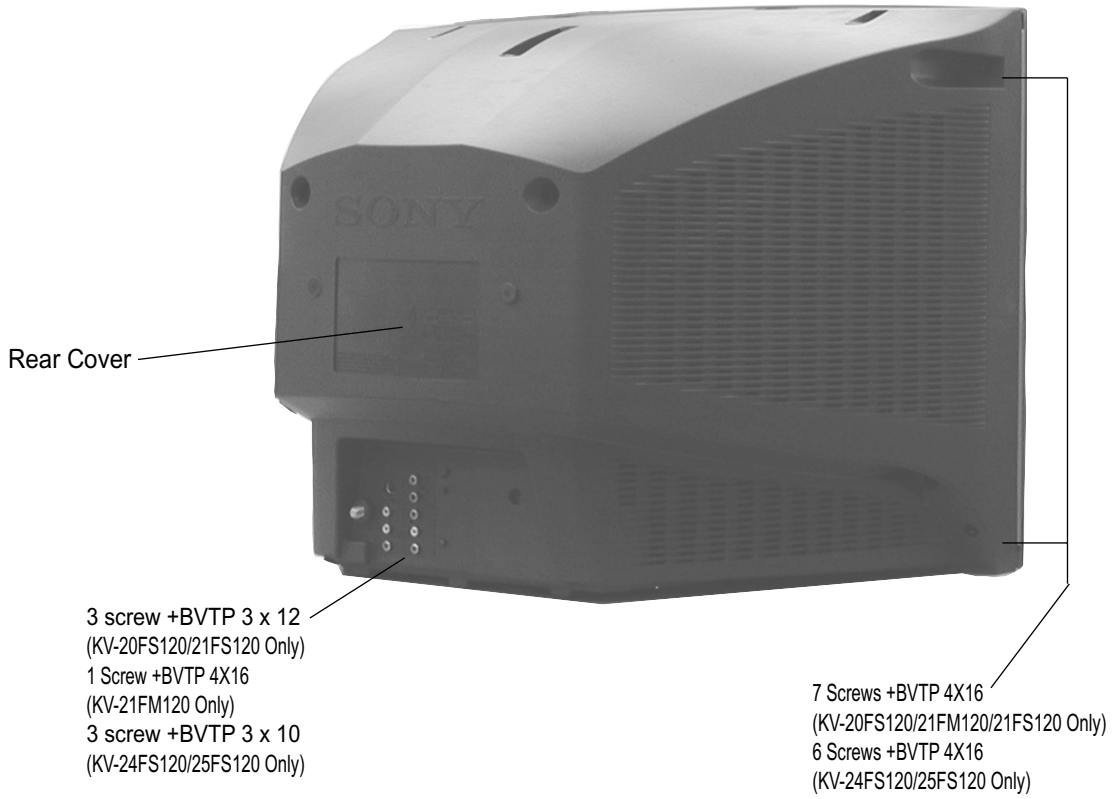
IK (AKB)

If the RGB levels* do not balance within 2 seconds after the power is turned on, this error will be detected by IC001 (A Board). TV will stay on, but there will be no picture.

*(Refers to the RGB levels of the AKB detection Ref pulse that detects 1K).

SECTION 1: DISASSEMBLY

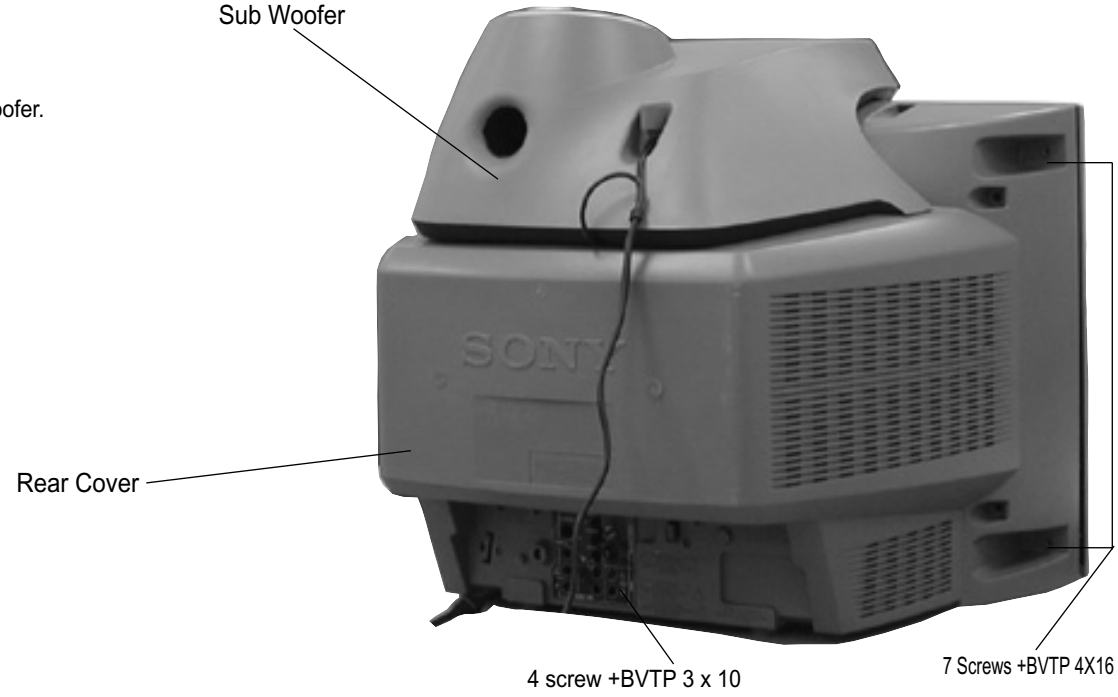
1-1. REAR COVER REMOVAL (ALL EXCEPT KV-21FA310)



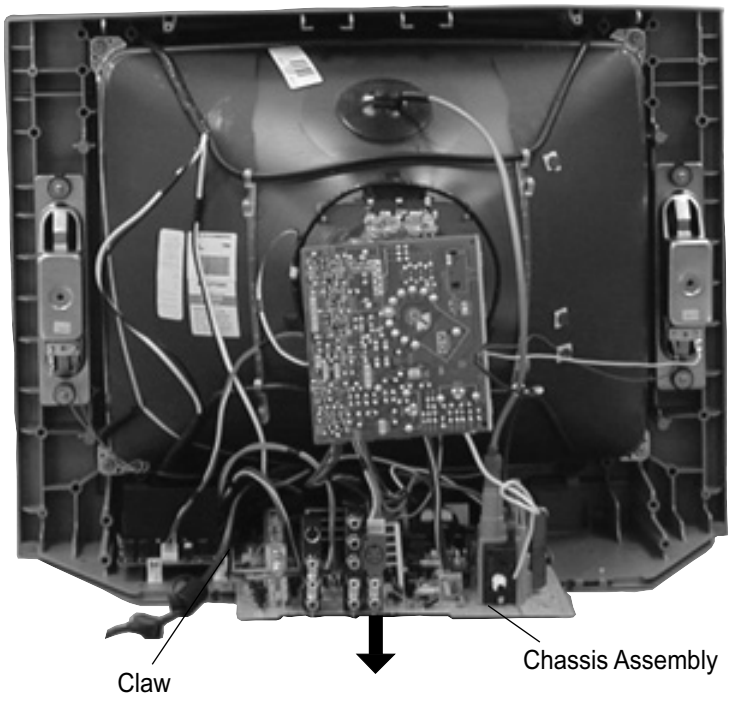
1-2. REAR COVER REMOVAL (KV-21FA310 ONLY)

① Lift to remove Sub-woofer.

② Remove screws.



1-3. CHASSIS ASSEMBLY REMOVAL

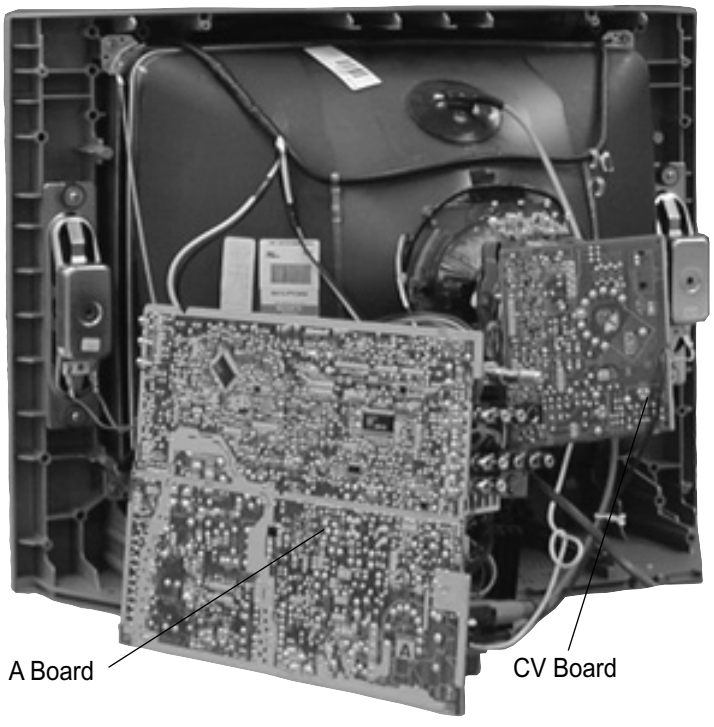


1-4. SERVICE POSITION

① Push down on clips to release K Board, then unplug the 2 pin woofer connector and move out of the way.

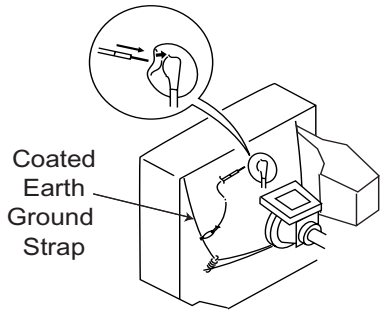
② Press on catch tab to release A Board.

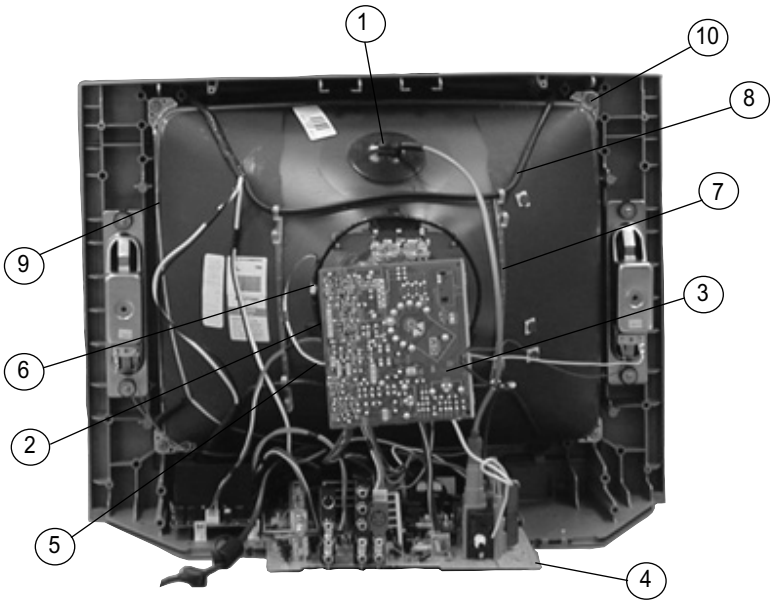
③ Disconnect remaining cables to allow A Board to be removed.



1-5. PICTURE TUBE REMOVAL

WARNING: BEFORE REMOVING THE ANODE CAP
High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT before attempting to remove the anode cap. Short between anode and CRT coated earth ground strap.



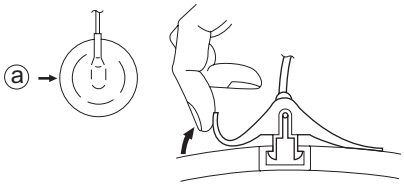


1. Discharge the anode of the CRT and remove the anode cap.
2. Unplug all interconnecting leads from the deflection yoke, neck assembly, degaussing coils and CRT grounding strap.
3. Remove the CV Board from the CRT.
4. Remove the chassis assembly.
5. Loosen the neck assembly fixing screw and remove.
6. Loosen the deflection yoke fixing screw and remove.
7. Place the set with the CRT face down on a cushion and remove the degaussing coil holders.
8. Remove the degaussing coils.
9. Remove the CRT grounding strap and spring tension devices.
10. Unscrew the four CRT fixing screws [located on each CRT corner] and remove the CRT [Take care not to handle the CRT by the neck].

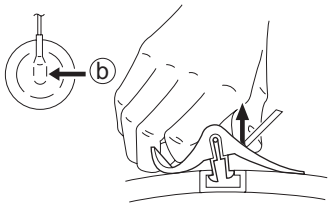
ANODE CAP REMOVAL PROCEDURE

WARNING: High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT **before** attempting to remove the anode cap. Short between anode and coated earth ground strap of CRT.
NOTE: After removing the anode cap, short circuit the anode of the picture tube and the anode cap to either the metal chassis, CRT shield, or carbon painted on the CRT.

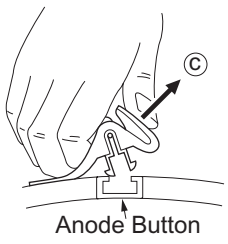
REMOVAL PROCEDURES



Turn up one side of the rubber cap in the direction indicated by arrow ⓐ .



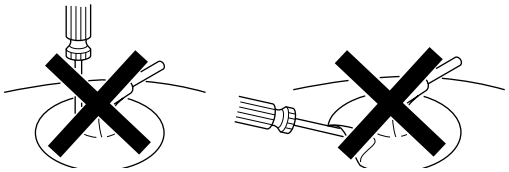
Use your thumb to pull the rubber cap firmly in the direction indicated by arrow ⓑ .



When one side of the rubber cap separates from the anode button, the anode cap can be removed by turning the rubber cap and pulling it in the direction of arrow ⓒ .

HOW TO HANDLE AN ANODE CAP

1. Do not use sharp objects which may cause damage to the surface of the anode cap.
2. To avoid damaging the anode cap, do not squeeze the rubber covering too hard. A material fitting called a shatter-hook terminal is built into the rubber.
3. Do not force turn the foot of the rubber cover. This may cause the shatter-hook terminal to protrude and damage the rubber.



SECTION 2: SET-UP ADJUSTMENTS

The following adjustments should be made when a complete realignment is required or a new picture tube is installed.

These adjustments should be performed with rated power supply voltage unless otherwise noted.

Set the controls as follows unless otherwise noted:
VIDEO MODE: Pro
PICTURE CONTROL: Normal
BRIGHTNESS CONTROL: Normal

Perform the adjustments in order as follows:

1. Beam Landing
2. Convergence
3. Focus
4. Screen (G2)
5. White Balance

Note Test Equipment Required:

1. Color Bar Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital Multimeter

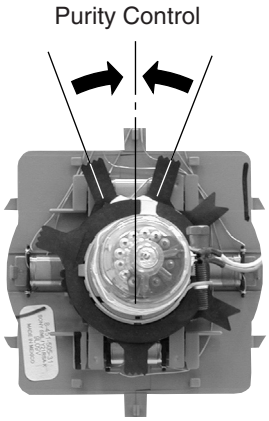
2-1. BEAM LANDING

Before beginning adjustment procedure:

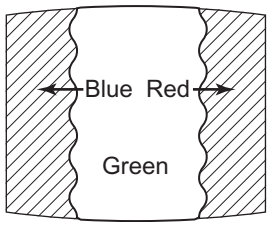
1. Degauss the entire screen.
2. Feed in the white pattern signal.

Adjustment Procedure

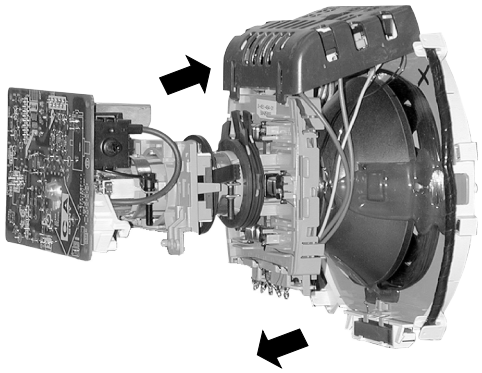
1. Input a raster signal with the pattern generator.
2. Loosen the deflection yoke mounting screw, and set the purity control to the center as shown below:

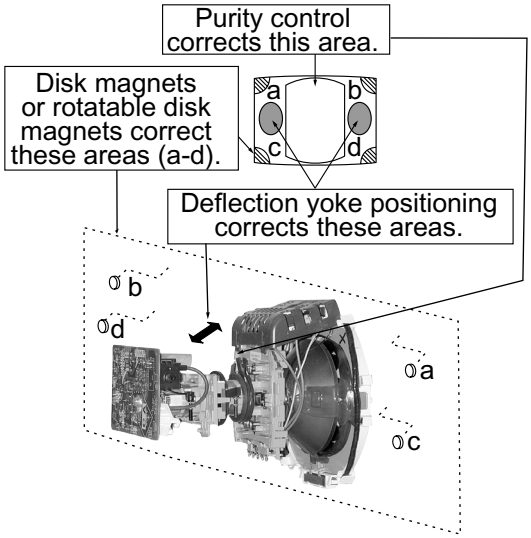


3. Turn the raster signal of the pattern generator to green.
4. Move the deflection yoke backward, and adjust with the purity control so that green is in the center and red and blue are even on both sides.



5. Move the deflection yoke forward, and adjust so that the entire screen becomes green.
6. Switch over the raster signal to red and blue and confirm the condition.
7. When the position of the deflection yoke is determined, tighten it with the deflection yoke mounting screw.
8. If landing at the corner is not right, adjust by using the disk magnets.





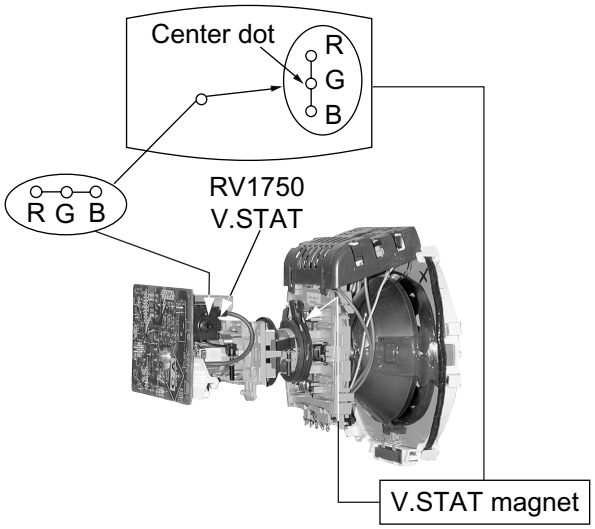
2-2. CONVERGENCE

Before starting convergence adjustments:

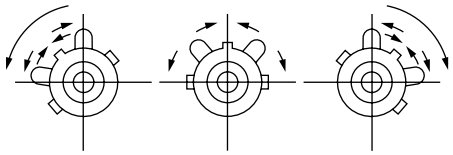
1 Perform FOCUS, VLIN and VSIZE adjustments.
2. Set BRIGHTNESS control to minimum.
3. Feed in dot pattern.

Vertical Static Convergence

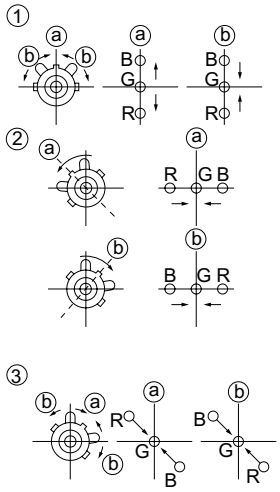
1. Adjust V. STAT magnet to converge red, green and blue dots in the center of the screen (Vertical movement adjust S V.STAT RV1750 to converge).



2. Tilt the V. STAT magnet and adjust static convergence to open or close the V. STAT magnet.



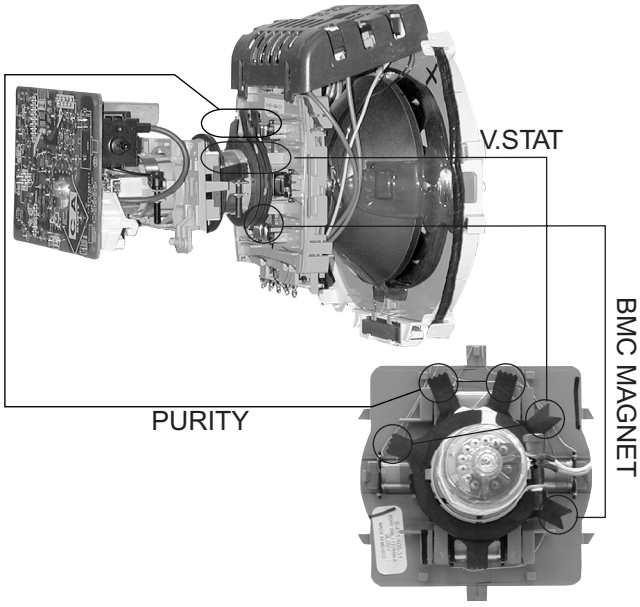
When the V. STAT magnet is moved in the direction of arrow a and b, red, green, and blue dots move as shown below:

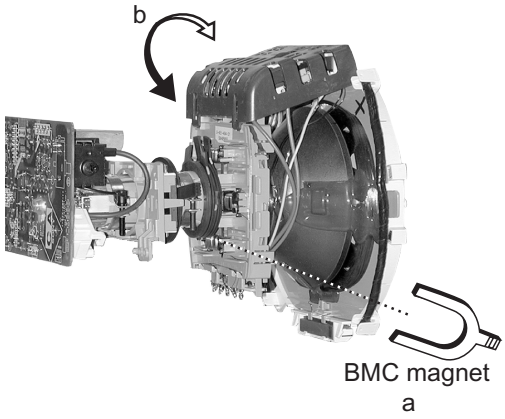


Horizontal Static Convergence

If the blue dot does not converge with the red and green dots, peform the following:

1. Move BMC magnet (a) to correct insufficient H.Static convergence.
2. Rotate BMC magnet (b) to correct insufficient V.Static convergence.
3. After adjusting the BMC magnet, repeat Beam Landing Adjustment.

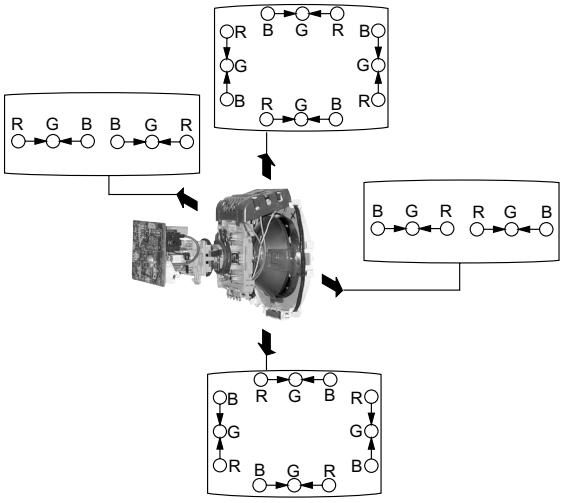




Dynamic Convergence Adjustment

Before performing this adjustment, perform Horizontal and Vertical Static Convergence Adjustment.

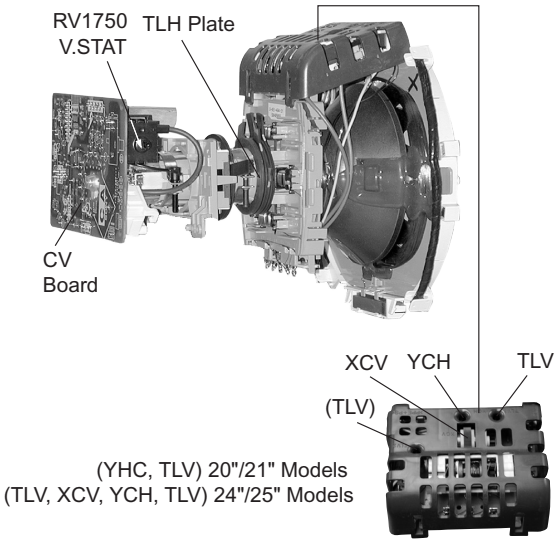
1. Slightly loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below:

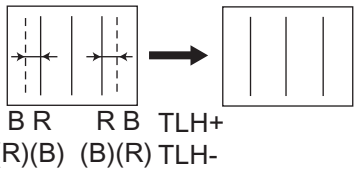


4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

TLH Plate Adjustment

1. Input crosshatch pattern.
2. Adjust PICTURE QUALITY to standard, PICTURE and BRIGHTNESS to 50%, and OTHER to standard.
3 Adjust the Horizontal Convergence of red and blue dots by tilting the TLH plate on the deflection yoke.

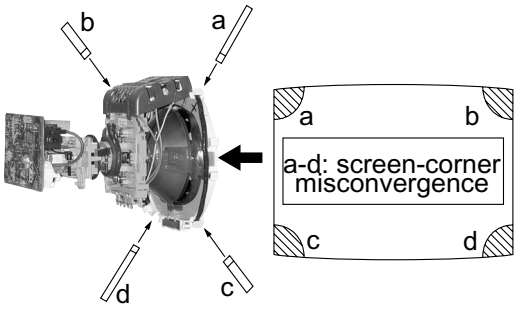




4. Adjust XCV core to balance X axis.
5. Adjust YCH VR to balance Y axis.
6. Adjust vertical red and blue convergence with V.TILT (TLV VR.)
   Note: Perform adjustment 3-6 while tracking items 1 and 2.

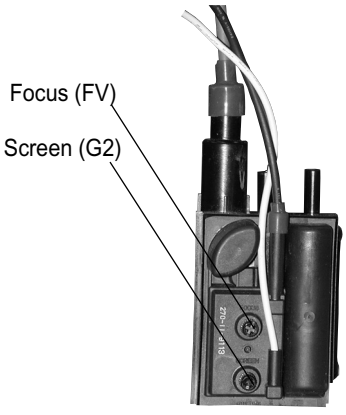
Screen-Corner Convergence

1. Affix a permalloy assembly corresponding to the misconverged areas:



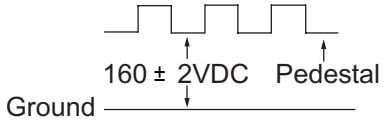
2-3. FOCUS

1. Adjust FOCUS control for best pictures.



2-4. SCREEN (G2)

1. Input a dot pattern.
2. Set the PICTURE and BRIGHTNESS controls at minimum and COLOR control at normal.
3. Adjust SBRT, GCUT, BCUT in service mode with an oscilloscope as shown below so that voltages on the red, green, and blue cathodes are 160 ± 2VDC.



4. Observe the screen and adjust SCREEN (G2) VR in FBT to obtain the faintly visible background of dot signal.

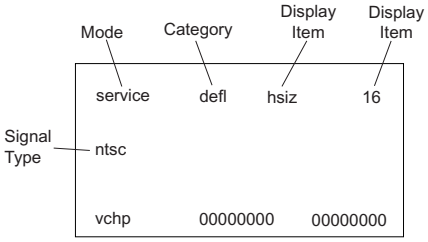
2-5. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

Service Mode Procedure

1. Standby mode (power off).
2. Press [Display] ➡ Channel [5] ➡ Sound Volume [+] ➡ Power on the Remote Commander (press each button within a second).

Service Adjustment Mode On

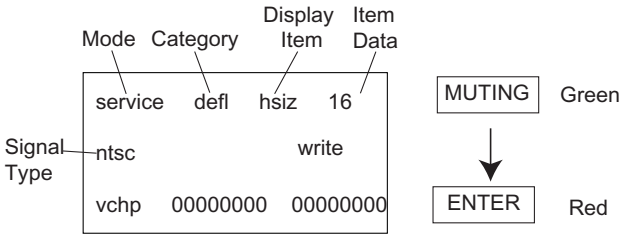
1. The CRT displays the time being adjusted.



2. Press [1] or [4] on the Remote Commander to select the time.
3. Press [3] or [6] on the Remote Commander to change the data.
4. Press [MUTING] then [ENTER] to save into the memory.

Service Adjustment Mode Memory

Turn the set off then on to exit Service Adjustment Mode.



2-6. WHITE BALANCE ADJUSTMENTS

1. Input an entire white signal with burst.
2. Set to Service Adjustment Mode.
3. Set the PICTURE and BRIGHTNESS to minimum.
4. Adjust with SBRT if necessary.
5. Select GCUT and BCUT with [1] and [4] .
6. Adjust with [3] and [6] for the best white balance.
7. Set the PICTURE and BRIGHTNESS to maximum.
8. Select GDRV and BDRV with [1] and [4].
9. Adjust with [3] and [6] for the best white balance.
10. Press [MUTING] then [ENTER] to save into the memory.

SECTION 3: SAFETY RELATED ADJUSTMENTS

3-1. ⋈ R565 CONFIRMATION METHOD (HV HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components which are marked with ◪ on the schematic diagram:

Part Replaced (◪)	Adjustment (⋈)
DY, T585, CRT, IC001, IC561, IC600, C506, C507, C508, T511, L510, C588, L588, C566, C561, C563, D567, D568, D566, PH602, R567, R568, R565, R566, R562, R563, R561, R528…….A Board	HV HOLD-DOWN RV565

Preparation Before Confirmation

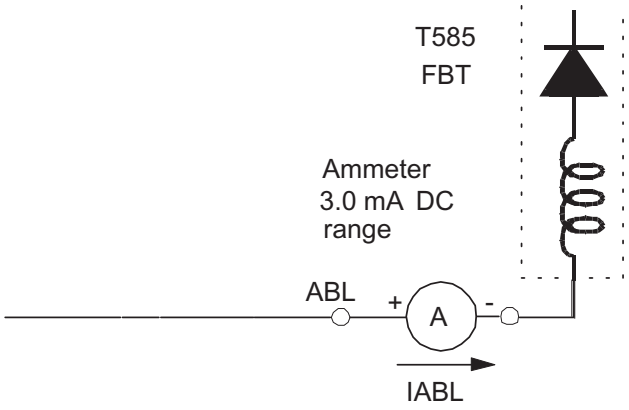
1. Using a Variac, apply AC input voltage: 120 ± 2 VAC.
2. Turn the POWER switch ON.
3. Input a white signal and set the PICTURE and BRIGHTNESS controls to maximum.
4. Confirm that the voltage between C566 (+) or TP30 and ground is more than 97 VDC for 20”/21” models, or 105 VDC for 24”/25” models.

Hold-Down Operation Confirmation

1. Connect the current meter between Pin 11 of the FBT (T585) and the PWB land where Pin 11 would normally attach (See Figure 1 on the next page).
2. Input a dot signal and set PICTURE and BRIGHTNESS to minimum: IABL = 100 ± 100µA.
3. Confirm the voltage of A Board TP-23 is 135.6 ± 1VDC.
4. Connect the digital voltmeter and the DC power supply via Diode 1SS119 to C566 (+) and ground (See Figure 1 on next page).
5. Increase the DC power voltage gradually until the picture blanks out.
6. Turn DC power source off immediately.
7. Read the digital voltmeter indication
   (standard < 117.0 VDC) for 20”/21” models
   (standard < 138.0 VDC) for 24”/25” models.
8. Input a white signal and set PICTURE and BRIGHTNESS to maximum: IABL = 1350 ± 100µA for 20”/21” models or
   IABL = 1650 ± 100µA for 24”/25” models
9. Repeat steps 4 through 7.

Hold-Down Readjustment

If the setting indicated in Step 2 of Hold-Down Operation Confirmation cannot be met, readjustment should be performed by altering the resistance value of R565 component marked with ⋈.



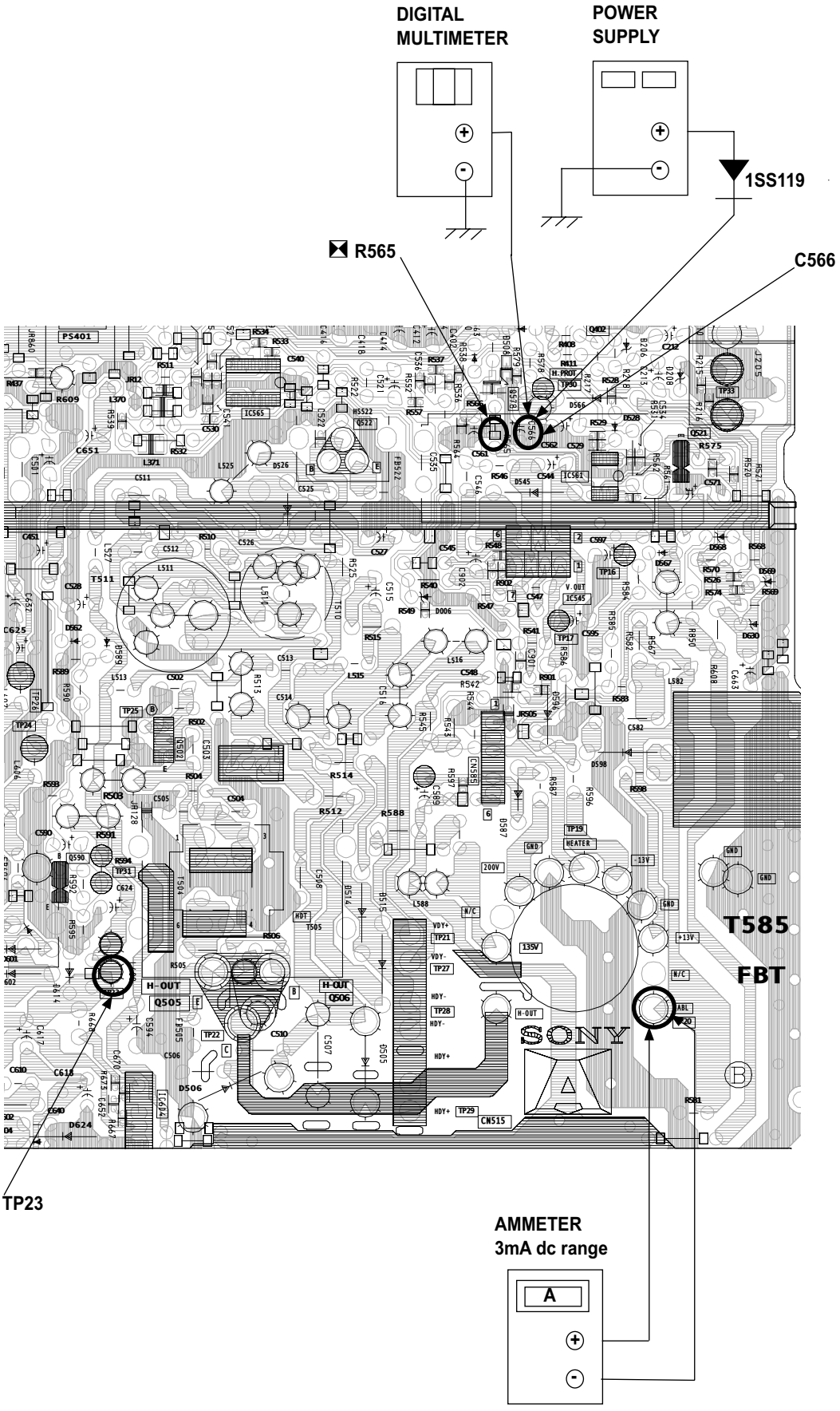
3-2. B+ VOLTAGE CONFIRMATION AND ADJUSTMENT

Note: The following adjustments should always be performed when replacing the following components, which are marked with ◪ on the schematic diagram on the A Board:

A BOARD:	◪ IC600, PH602

1. Using a Variac, apply AC input voltage: 130 + 2.0 / - 0.0 VAC.
2. Input a DOT pattern at Q.C.
3. Set the PICTURE and the BRIGHTNESS controls to minimum.
4. Confirm the voltage of A Board between TP-23 & Ground is =135.6 ± 1VDC.
5. If step 4 is not satisfied, replace the components listed above, then repeat steps 1 through 3.

FIGURE 1


DIGITAL
MULTIMETER
POWER
SUPPLY
1SS119
R565
C566
T585
FBT
TP23
AMMETER
3mA dc range
A

SECTION 4: CIRCUIT ADJUSTMENTS

Electrical AdjustmenTs by Remote Commander

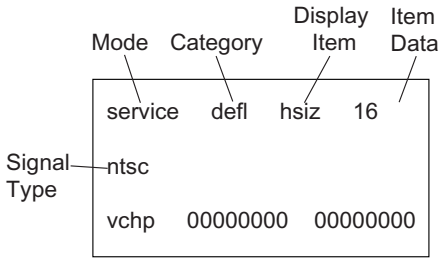
Use the Remote Commander (RM-Y194, RM-W151, RM-Y180) to perform the circuit adjustments in this section.
Test Equipment Required: 1. Pattern generator 2. Frequency counter 3. Digital multimeter 4. Audio oscillator

4-1. SETTING THE SERVICE ADJUSTMENT MODE

1. Standby mode (Power off).
2. Press the following buttons on the remote commander within a second of each other:
   Display ➡ Channel 5 ➡ Sound Volumne + ➡ Power

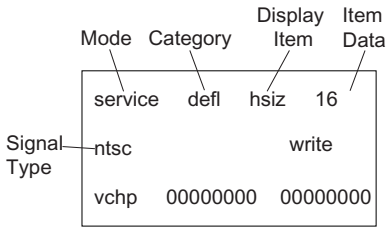
Service Adjustment Mode On

1. The CRT displays the item being adjusted.

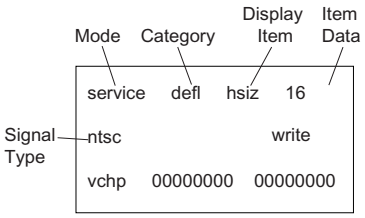


2. Press 1 or 4 on the Remote Commander to select the item.
3. Press 3 or 6 on the Remote Commander to change the data.
4. Press MUTING then ENTER to write into memory.

Service Adjustment Mode Memory



1. Press 8 then ENTER on the Remote Commander to initialize.



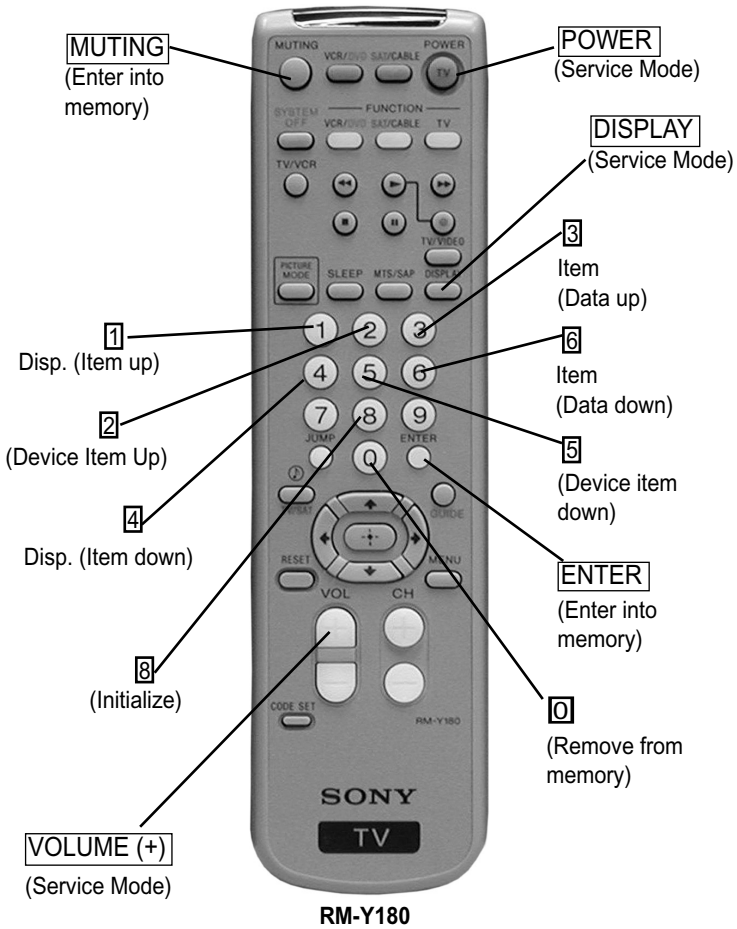
Carry out Step 1 when adjusting IDs 0-6 and when replacing and adjusting IC002

3. Press MUTING then ENTER to write into memory.
2. Turn set off then on to exit Service Adjustment Mode.

4-2. MEMORY WRITE CONFIRMATION METHOD

1. After adjustment, pull out the plug from the AC outlet, then replace the plug in the AC outlet again.
2. Turn the power switch ON and set to Service Mode.
3. Call the adjusted items again to confirm they were adjusted.

4-3. REMOTE ADJUSTMENT BUTTONS AND INDICATORS



RM-Y180

4-4. SERVICE DATA LISTS

Service Group	Fix/ Var	No.	Name	Description	NTSC Init Data
VERSION	Fix	0	VER	Microprocessor version information	=
DEF	VAR	1	HSIZ	H-SIZE (EW DC : YUV OFFSET)	29
	VAR	2	HPOS	H POSITION: YUV OFFSET	37
	VAR	3	VSIZ	V RAMP SIZE: YUV OFFSET	35
	VAR	4	VPOS	V POSITION (RAMP DC) NOT USEFUL: YUV OFFSET	33
	VAR	5	VLIN	V LINEARITY	31
	VAR	6	SCOR	S CORRECTION	26
	VAR	7	VBOW	BOW	37
	VAR	8	VANG	ANGLE	31
	VAR	9	TRAP	EW TRAPESIUM	25
	VAR	10	PAMP	PARABOLA (EW PIN)	9
	VAR	11	UPIN	UPPER CORNER (UPPER PIN)	32
	VAR	12	LPIN	LOWER CORNER (LOWER PIN)	32
	VAR	13	TROT	TROT	109
	VAR	14	HBLK	FBPBLK (H BLK MODE SELECT)	0
	VAR	15	RBLK	HBLK R POS (HBLK REAR TIMING: YUV OFFSET)	15
	VAR	16	LBLK	HBLK F POS (HBLK FRONT TIMING: YUV OFFSET)	48
	FIX	17	VBLK	VBLK POS (V BLK WIDTH)	0
	FIX	18	HMSK	Macro OFF (TOP VEND [WHEN MACROVISION] PREVENT OFF)	0
	FIX	19	HDW	IIC_HOUT_DUTY (H PULSE WIDTH [25u/19u]	1
	FIX	20	AFC	H AFC Gain (AFC GAIN)	0
	FIX	21	AFC1	H Charge pump (AFC1 TIME CONSTANT)	3
	FIX	22	AFCW	AFC1 PULLIN (AFC1 PULL IN WIDE)	0
	FIX	23	CDMD	V CD MODE (V DET WINDOW SW TIMING)	1
	FIX	24	HSS	SYNC SLICE LVL(H) (SYNC SLICE LEVEL [H sepa])	0
	FIX	25	VSS	SYNC SLICE LVL(L) (SYNC SLICE LEVEL [V sepa])	3
	FIX	26	SLDN	AUTO SLICE DOWN (AUTO SLICE LEVEL DOWN)	0
	FIX	27	SLUP	AUTO SLICE UP (AUTO SLICE LEVEL UP)	0
	FIX	28	JPSW	VJPSW (JUMP SW)	0
	FIX	29	HOSC	H VCO FOR OFFSET ADJUST OFFSET	5
	FIX	30	EHT	EHT	4
	FIX	31	EHTG	EHT GAIN (EHT MODE)	1

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
16 : 9	VAR	1	VSIZ	V RAMP SIZE	55
	VAR	2	VPOS	V POSITION (RAMP DC)	37
	VAR	3	VLIN	V LINEARITY	30
	VAR	4	SCOR	S CORRECTION	20
	VAR	5	TRAP	EW TRAPESIUM	30
	VAR	6	PAMP	PARABOLA (EW PIN)	0
	VAR	7	UPIN	UPPER CORNER (UPPER PIN)	34
	VAR	8	LPIN	LOWER CORNER (LOWER PIN)	32
	VAR	9	ABLG	ABL GAIN	15
	VAR	10	SCON	SUB CONTRAST LEVEL	10
	VAR	11	VPW	JUMP PULSE WIDTH	1

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
VP1	VAR	1	RDRV	R DRIVE	45	45	45	N/A
	VAR	2	GDRV	G DRIVE: GDOF OFFSET (only Color Temp. "Warm")	28	28	30	N/A
	VAR	3	BDRV	B DRIVE: BDOF OFFSET (only Color Temp. "Warm")	33	33	29	N/A
	VAR	4	RCUT	HARDWARE AKB (R) CMP DATA	120	120	120	N/A
	VAR	5	GCUT	HARDWARE AKB (G) CMP DATA	98	98	72	N/A
	VAR	6	BCUT	HARDWARE AKB (B) CMP DATA	102	102	91	N/A
	VAR	7	SCON	SUB CONTRAST LEVEL	16	16	16	N/A
	VAR	8	SHUE	SUB TINT (HUE)	7	7	7	N/A
	VAR	9	SCOL	SUB COLOR LEVEL	17	17	27	N/A
	VAR	10	SBRT	SUB BRIGHTNESS	11	11	14	N/A
	FIX	11	RON	R OUTPUT ON (0:R OUTPUT OFF 1:R OUTPUT ON)	1			
	FIX	12	GON	G OUTPUT ON (0:R OUTPUT OFF 1:R OUTPUT ON)	1			
	FIX	13	BON	B OUTPUT ON (0:R OUTPUT OFF 1:R OUTPUT ON)	1			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
VP1	FIX	14	BLLV	BLUE STRETCH (00:NO<->11:DEEP) only Color Temp "Cool"	1			
	FIX	15	MTRX	MATRIX RATIO SELECT	0			
	FIX	16	AXIS	R-Y PHASE SELECT	52			
	VAR	17	SSHO	SUB SHARPNESS GAIN (OVER) RF/VIDEO	10	26	25	N/A
	VAR	18	SSHP	SUB SHARPNESS GAIN (PRE) RF/VIDEO	15	31	30	N/A
	VAR	19	SHPF	SHARPNESS FOR (00:2 CLK <-> 11:5 CLK)	1	0	0	N/A
	FIX	20	SHCL	SHARPNESS CORING LEVEL	0			
	FIX	21	SHMX	SHARPNESS LIMITER LEVEL	15			
	FIX	22	ACLV	ACL GAIN	0			
	FIX	23	AKBD	AKB SELF DIAGNOSTIC COUNTER (@1 SEC)	2			
	FIX	24	AKBS	AKB SWITCH (0:AKB OFF 1:H/W AKB ON)	1			
	FIX	25	REFP	AKB REFPLS TIMING	0			
	FIX	26	YNRC	YNR LIMITER LEVEL	15			
	FIX	27	BKON	BLACK STRETCH ON	1			
	FIX	28	BKAT	BLACK STRETCH DETECTOR TIME CONSTANT1	15			
	FIX	29	BKRC	BLACK STRETCH DETECTOR TIME CONSTANT2	4			
	FIX	30	BKDP	BLACK STRETCH DEPTH	soft cont'l			
	FIX	31	BKSP	BLKSTPNT BLACK STRETCH POINT	2			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
VP2	FIX	1	VMOF	VM GAIN(Off) (VM LEVEL AT "OFF" SETTING)	2			
	FIX	2	VMLO	VM GAIN(Low) (VM LEVEL AT "LOW" SETTING)	4			
	FIX	3	VMHI	VM GAIN(High) (VM LEVEL AT "HIGH"SETTING)	8			
	FIX	4	VMDL	VM DELAY (VM DELAY)	6			
	FIX	5	VMPL	VM POL (VM POLARITY)	0			
	FIX	6	VMWD	VM WIDTH (VM WIDTH)	0			
	FIX	7	VMCL	VM CORING LEVEL (VM CORING LEVEL)	0			
	FIX	8	VMMX	VM MAX (VM LIMITER LEVEL)	15			
	FIX	9	CKLV	KILLER LEVEL (VM COLOR KILLER VTH)	1	1	0	N/A
	FIX	10	CKON	FORCE KILLER (FORCE KILLER)	0			
	FIX	11	ALFA	ALFA (ADAPTIVE DET SENSITIVITY)	2			
	FIX	12	YCMD	MANEXP (YC SEPA FORCE SELECT [00:ADAPTIVE 01:H 10:V 11:HV])	0			
	FIX	13	VACL	V APERTURE CORING LV (V APERTURE CORING LEVEL)	0			
	FIX	14	VAGA	V APERTURE GAIN (V APERTURE GAIN LEVEL)	soft cont'l			
	FIX	15	VAMX	V APERTURE MAX GAIN (V APERTURE LIMITER LEVEL)	5			
	FIX	16	GAMM	GAMMA (GAMMA [00:NO <-> 11:DEEP])	soft cont'l			
	FIX	17	YDLY	Y DELAY (Y DELAY TIME)	1	1	3	N/A
	FIX	18	CDLY	C DELAY (C DELAY TIME)	0			
	FIX	19	YOFF	Y Mute (Y OUTPUT MUTE)	0			
	FIX	20	CBPF	SAW FILTER(7.2MHzBPF) (C BPF FOR HI)	0			
	FIX	21	BGPP	BGP POS (BGP [FOR C DECODER] TIMING)	9	9	28	N/A
	VAR	22	GDOF	G DRIVE OFFSET only Color Temp. "Warm"	9			
	VAR	23	BDOF	B DRIVE OFFSET only Color Temp. "Warm"	14			
	VAR	24	GCOF	G CUT CMP DATA OFFSET only Color Temp. "Warm"	11			
	VAR	25	BCOF	B CUT CMP DATA OFFSET only Color Temp. "Warm"	28			
	VAR	26	DCTV	DCTRAN VTH<6:0> (DCTRANSFER VTH)	30			
	FIX	27	DCTG	DCTRAN GAIN<4:0> (DCTRANFER GAIN)	soft cont'l			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
NR	VAR	1	SCOL	SUB COLOR LEVEL	17
	VAR	2	SHCL	SHARPNESS CORING LEVEL	15
	VAR	3	SHMX	SHARPNESS LIMITER LEVEL	7
	FIX	4	YNRC	YNR LIMITER LEVEL	7
	FIX	5	VMHI	VM LEVEL AT " HIGH " SETTING	10
	FIX	6	VMCL	VM CORING LEVEL	0
	FIX	7	VMMX	VM LIMITER LEVEL	7
	FIX	8	VAMX	V APERTURE LIMITER LEVEL	0
	FIX	9	GAMM	GAMMA (00: NO < - > 11:DEEP)	0
	FIX	10	YNRS	YNR ON	1
	FIX	11	WSTH	WEAK SIGNAL VTH	7
	FIX	12	WSVA	WEAK SIGNAL VIDEO ATT	0
	FIX	13	WSCA	WEAK SIGNAL CHROMA ATT	5
	FIX	14	NRCH	THRNZV1(NOISE DET TIME CONSTANT)	0
	FIX	15	NRCL	THRNZV2 (NOISE DET TIME CONSTANT)	16
	FIX	16	NRVL	THRNZH1 (NOISE DET VTH)	2
	FIX	17	NRVH	THRNZH2 (NOISE DET VTH)	0
	FIX	18	IPNC	DETNZ STATUS COUNTER	2
	FIX	19	IPNV	DETECTION PERIOD	10

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC BA6 DATA (DEC)			
					PALLET = VIVID	PALLET = STD	PALLET = MOVIE	PALLET = PRO
PALLET	FIX	1	VPIC	PICTURE	63	50	37	31
	FIX	2	VBRI	BRIGHTNESS	27	30	31	31
	FIX	3	VCOL	COLOR	37	32	31	31
	FIX	4	VHUE	HUE	31	31	31	31
	FIX	5	VSHA	SHARPNESS	31	32	31	21
	FIX	6	VVM	VM	2	1	0	0
	FIX	7	VTRI	COLOR TEMP	0	1	2	1
	FIX	8	VAPA	APERTURE G	5	5	3	0
	FIX	9	VGMA	GAMMA	3	1	0	0
	FIX	10	VDCT	DCT LV	23	15	2	2
	FIX	11	VBKP	BLACK STRETCH DEPTH (VIDEO)	3	3	4	7
	FIX	12	TBKD	BLACK STRETCH DEPTH (TUNER)	3	3	4	7

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
Y	FIX	1	YNRS	YNR SW (YNR ON)	0
	FIX	2	YTHR	Y THR 2D (Y SIGNAL THROUGH 2DYCS)	0
	FIX	3	Y2D	Y2D Fix (Y SIGNAL GENERATE from 2DYCS)	0
	FIX	4	2DFX	C BPF Fix (C SIGNAL GENERATE from H/V BPF only	1
	FIX	5	CLPS	CLAMP CONTROL SW (0: CLAMP OFF. 1: CLAMP AUTO. 2: CLAMP ON]	1
	FIX	6	VLPF	VIDEO LPF (Y_LPF [ANALOG] for adjust)	3
	FIX	7	CLPF	CHROMA LPF (C_LPF [ANALOG] for adjust)	3
	FIX	8	BPFB	YCS HBPF BACK (YCS HBPF SELECT [BACK])	1
	FIX	9	BPFF	YCS HBPF FRONT (YCS HBPF SELECT [FRONT])	1
	FIX	10	BKTS	BS T2 IFON (BLACK STRETCH RECOVER TIME OUT	0
	FIX	11	VMG_2	$VMGAIN_2$ (MODULATOR FEEDBACK GAIN CONTROL	2
	FIX	12	CLPT	CLAMP KEEP TIMER (CLAMP AUTO ON KEEP TIMER COUNT [@ 100 MS])	15

Service Group	Fix/ Var	No.	Name	Item name & (Description)	A8 Init Data	Video	YUV	16:09
C	FIX	1	A1FL	AMP OFF1 L (ANALOG ACC hysteresis)	90			
	FIX	2	A1ON	AMP ON (ANALOG ACC AMP ON LEVEL)	4			
	FIX	3	ACCS	ACC SW (ACC ON/OFF)	0	0	1	N/A
	FIX	4	AASL	AVE SEL (C DECODER TIME CONSTANT [32, 16, 8, 1H])	2			
	FIX	5	BASL	B2AVE SEL (ACC TIME CONSTANT)	0			
	FIX	6	XFFR	FREE RUN (VCXO FORCE FREERUN)	0	0	1	N/A
	FIX	7	A2ON	AMP2 ON Thresh (ABL VTH)	4			
	FIX	8	A3ON	AMP3 ON Thresh (ACL VTH)	4			
	FIX	9	A2FL	AMP2 OFF Thresh L (AMP2 OFF LEVEL LOWER)	64			
	FIX	10	A3FL	AMP3 OFF Thresh L (AMP3 OFF LEVEL LOWER)	64			
	FIX	11	AXTH	AXIS HYS (AXS HYS)	30			
	FIX	12	ACTH	ROM HYS (ROM HYS)	10			
	FIX	13	AVAV	AVE SEL AV (AVE SEL AV)	3			
	FIX	14	B2TH	B2COMP (B2COMP)	0			
	FIX	15	ACCP	ACC COMP (ACC COMP)	0			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
RGB	FIX	1	AMUT	RGB POWER ON MUTE (RGB POWER ON MUTE)	0			
	FIX	2	PMUT	RGB Mute before OSD (RGB MUTE [EXCEPT OSD]	1			
	FIX	3	CORL	CUTOFF R L (R CUTOFF LOWER)	212			
	FIX	4	CORH	CUTOFF R H (R CUTOFF UPPER)	0			
	FIX	5	COGL	CUTOFF G L (G CUTOFF LOWER WHEN TEMP IS "COOL" AND "NEUTRAL"	197			
	FIX	6	COGH	CUTOFF G H (G CUTOFF LOWER WHEN TEMP IS "COOL" AND "NEUTRAL"	0			
	FIX	7	COBL	CUTOFF B L (B CUT OFF LOWER WHEN TEMP IS "COOL" AND "NEUTRAL"	176			
	FIX	8	COBH	CUTOFF B H (B CUT OFF LOWER WHEN TEMP IS "COOL" AND "NEUTRAL"	0			
	FIX	9	ABLS	ABL SEL (ABL SELECT)	0			
	FIX	10	ALSP	ACL SPEED (ACL SPEED)	0			
	FIX	11	ALRS	ACL SPE (ACL RECOVER SPEED)	2			
	FIX	12	ALAS	ACL ASPE (ACL ATACK SPEED)	9			
	FIX	13	ABLG	ABL GAIN (ABL GAIN)	5			
	FIX	14	ALS2	ACLASPE2 (ACL ATACK SPEED [2])	2			
	FIX	15	AKBM	AKB MODE (AKB MODE)	0			
	FIX	16	AKBP	AKB P[5:0] (AKB PULSE HEIGHT)	16			
	FIX	17	OSDL	OSD LIMIT (OSD LIMMIT SELECT)	0			
	FIX	18	UVIN	Y/U/V UVINV (U/V INVERT)	0			
	FIX	19	UVG	U/V GAIN (U/V OFFSET CANCELER ON)	0			
	FIX	20	UOFS	U IN OFFSET (U IN OFF SET)	7			
	FIX	21	VOFS	V IN OFFSET (V IN OFFSET)	15			
	FIX	22	AALG	ANA ACL GAIN (ANALOG ACL GAIN CONTROL)	0			
	FIX	23	AALS	ANA ACL ON (ANALOG ACL ON/OFF CONTROL)	1			
	FIX	24	UVDE	UV_DITHER_EN (UVIN DITHER ENABLE)	0	0	1	N/A
	FIX	25	UVDT	UV_DITHER_TEST (UVIN DITHER TEST)	0	0	6	N/A

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
DEFD	FIX	1	HFFR	AFC FREE RUN (AFC1 FORCE FREE RUN)	0			
	FIX	2	HFUP	HFREE UP (H FREE RUN FREQUENCY UP [700 Hz]	0			
	FIX	3	JSWW	VJP WIDTH (JUMP PULSE WIDTH)	0			
	FIX	4	EWCL	V/EW DAC CLK CONTROL (EW/VRAMP DA CLOCK SELECT)	0	0	0	N/A
	FIX	5	XF0A	FREE RUN OFFSET (VCXO FREE RUN ADJUST)	0			
	FIX	6	BGST	BG START (BGP [FOR PLL] TIMING)	16	16	1	N/A
	FIX	7	XPHA	VCXO CTL (VXCO PHASE ADJUST)	10			
	FIX	8	HRMP	Ramp Slew Rate (AFC2 TIME CONSTANT)	3			
	FIX	9	RPLU	Ref Charge pump (REF PLL TIME CONSTANT)	3			
	FIX	10	RPLB	Ref VCO (REF PLL TIME CONSTANT)	1			
	FIX	11	XF0B	VCXO FREE RUN (VXCO Fo ADJUST)	0			
	FIX	12	RPLS	REF FB SW (REF VCO FB LOOP SELECT)	0			
	FIX	13	SSM	Sync Sepa Mask (SyncSepaMasking CONTROL)	0			
	FIX	14	VSAG	V-sag (V-SAG prevent ON)	0			
	FIX	15	AFC2	AFC2 Gain (AFC2 GAIN CONTROL)	3			
	FIX	16	VRFL	V RAMP FIL OFF (V RAMP FILTER SWITCHING OFF)	1			
	FIX	17	SSLP	LPY SYNC (LFP pre SYNC SEPA ON/OFF	1			
	FIX	18	XPLU	B PLL Change pump (ACP TIME CONSTANT)	1			
	FIX	19	8FSC	8FSC SEL (8fsCLK Skew OFF)	1	1	0	N/A
	FIX	20	4FS2	4FSC SEL2 (4fsCLK Skew OFF)	1	1	0	N/A
	FIX	21	CDM2	V_CD_MODE2 (V_LOGIC SW)	1			
	FIX	22	BGPC	Add. FTN BGP C (BGP C)	0			
	FIX	23	MHDL	Add. FTN BGP SEL (BBP SEL)	1			
	FIX	24	BFRE	V FREE (FORCE V FREE RUN)	0			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
DEFD	FIX	25	HRPP	AFC2 RAMP POS (FRAMP RRAMP H OUT CONTROL RANGE	8			
	FIX	26	DSCK	CLOCK SEL (DS DAC CLK SW 2)	1	1	1	0
	FIX	27	VBHK	VBLK HALFKIL (V BLK HALF KILL)	0			
	FIX	28	VPW	V PLS WIDTH (V Pulse Wide)	1			
	FIX	29	DTH	D THRESHOLD LEVEL (DITHER THRESHOLD LEVEL CONTROL AT IIC AUTOD= ON	0			
	FIX	30	SLON	LPF SYNC ON (LPF SYNC ON)	1			
	FIX	31	VSSW	SYNC SLICE LVL(V)_W (SYNC SLICE LEVEL [V] Wide Window	0			
	FIX	32	AF2S	AFC2_SEL (ADC2 TIMING SW)	0			
	FIX	33	VSL2	V_SYNC_LPF_2 (DIGITAL V_SINC_LPF [Fall])	0			
	FIX	34	VSL1	V_SYNC_LPF_1 (DIGITAL V_SINC_LPF [Rise])	1			
	FIX	35	VYUV	YUV VSIZE OFFSET (YUV V-SIZE OFFSET)	8			
	FIX	36	VYVP	YUV VPOS OFFSET (YUV V-POSITION OFFSET)	8			
	FIX	37	VYHS	YUV HSIZE OFFSET (YUV H-SIZE OFFSET)	8			
	FIX	38	VYHP	YUV HPOS OFFSET (YUV H-POSITION OFFSET)	7			
	FIX	39	VSHE	V-SHRINK MODE (V-SHRINK MODE for AV)	0			
	FIX	40	VYRB	YUV RBLK (YUV RBLK OFFSET)	7			
	FIX	41	VYLB	YUV LBLK (YUV LBLK OFFSET)	7			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
OTHER	FIX	1	PCLP	pedestal CLAMP ON/OFF (SYNC TIP/PEDESTAL CLAMP SELECT)	0			
	FIX	2	VRT	VRT Voltage (ADC REFERENCE [00:1.15Vpp 01:1.25 Vpp 10:1.35 Vpp 11:1.45 Vpp])	1			
	FIX	3	14HI	INV 14H CLK (4fsc [Skew] CLK POLARITY)	0	0	0	N/A
	FIX	4	14HD	14H CLK DLY (4fscCLK [Skew] CLK DELAY ADJUST)	0	0	0	N/A
	FIX	5	DSI	INV DS CLK (8fscCLK POLARITY)	0	0	0	N/A
	FIX	6	DSD	DS CLK DLY (8fscCLK DELAY ADJUST)	0	0	0	N/A
	FIX	7	ADCD	AD CLK DLY (ADC CLK DELAY ADJUSTO)	0	0	1	N/A
	FIX	8	4FSC	4FSC SW (AD/LOGIC CLK SWAP)	0			
	FIX	9	WSTH	WEAK_SIG_VTH (WEAK_SIGNAL VTH)	0			
	FIX	10	WSVA	WEAK SIG VIDEO ATT (WEAK SIGNAL VIDEO ATT)	0	0	0	N/A
	FIX	11	WSCA	WEAK SIG CHROMA ATT (WEAK SIGNAL CHROMA ATT)	0	0	0	N/A
	FIX	12	VREF	VREF_SEL (AD REFERENCE SELECT [VZ])	0			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
OSD	FIX	1	HT	HT (HALF TONE LEVEL)	0
	FIX	2	OSLR	OSD LVL R (R OSD LEVEL)	25
	FIX	3	OSLG	OSD LVL G (G OSD LEVEL)	25
	FIX	4	OSDC	OSD COMP (OSD COMP)	0
	FIX	5	OSLB	OSD LVL B (B OSD LEVEL)	25

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
H/W AKB	FIX	1	HRIL	H/W AKB R INI DATA L (H/W AKB RED OUTPUT LOWER)	soft cont'l
	FIX	2	HRIH	H/W AKB R INI DATA H (H/W AKB RED OUTPUT UPPER)	soft cont'l
	FIX	3	HGIL	H/W AKB G INI DATA L (H/W AKB GREEN OUTPUT LOWER)	soft cont'l
	FIX	4	HGIH	H/W AKB G INI DATA H (H/W AKB GREEN OUTPUT UPPER)	soft cont'l
	FIX	5	HBIL	H/W AKB B INI DATA L (H/W AKB BLUE OUTPUT LOWER)	soft cont'l
	FIX	6	HBIH	H/W AKB B INI DATA H (H/W AKB BLUE OUTPUT UPPER)	soft cont'l
	FIX	7	HLM1	AKB_LIM1<7:0> (H/W AKB LIM1)	6
	FIX	8	HLM2	AKB_LIM2<7:0> (H/W AKB LIM2)	12
	FIX	9	HLM3	AKA_LIM3<7:0> (H/W AKB LIM3)	21
	FIX	10	HAD1	AKB_ADD1<7:0> (H/W AKB SPEED1)	2
	FIX	11	HAD2	AKB_ADD2<7:0> (H/W AKB SPEED2)	6
	FIX	12	HAKE	AKB_EN (H/W AKB MANUAL [MCU] / HARD	1
	FIX	13	HASP	AKB_SPEED (H/W AKB SPEED)	3
	FIX	14	HERL	AKB_SWERR<7:0> (H/W AKB ERROR DET THRESH)	40
	FIX	15	HLMC	AKB_ERRC<7:0> (H/W AKB ERROR DET TIME)	20
	FIX	16	HPWL	AKBSWPON<7:0> (H/W AKB POWER ON TRESH)	4
	FIX	17	HPWC	AKB_PWERRC (H/W AKB POWER ON TIME)	90
	FIX	18	HFMT	H/W AKB2 HOLD TIMER (H/W AKB2 HOLD TIMER (@ 100 MSEC) [0: No hold]	20
	FIX	19	SPMT	AKB POW ON MUTE EXIT (AKB POWER ON MUTE EXIT TIMMER)	120

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC 21FA310	20FS120	21FM120	24FS120
AUDIO PROCESSOR	VAR	1	SBAL	SBAL (SUB BALANCE)	4	4	4	4
	VAR	2	SBAS	SBAS (SUB BASS)	0	6	4	7
	VAR	3	STRE	STRE (SUB TREBLE)	0	7	7	7
	VAR	4	SRL	SRL (SURROUND LEVEL)	0	0	0	0
	VAR	5	BBOL	BBOL (SURROUND OFF-BBE LOW)	4	0	0	0
	VAR	6	BBOH	BBOH (SURROUND OFF-BBE HIGH)	7	0	0	0
	VAR	7	BBSL	BBSL (SIMULATE BBE LOW)	2	0	0	0
	VAR	8	BBSH	BBSH (SIMULATE BBE HIGH)	7	0	0	0
	VAR	9	BBGL	BBGL (WOW GAME BBE LOW)	4	0	0	0
	VAR	10	BBGH	BBGH (WOW GAME BBE HIGH)	9	0	0	0
	VAR	11	BBTL	BBTL (SRS BBE LOW)	0	0	0	0
	VAR	12	BBTH	BBTH (SRS BBE HIGH)	0	0	0	0
	VAR	13	BBDL	BBDL (Audio Processor Prologic BBE Low for DOLBY)	3	0	0	0
	VAR	14	BBDH	BBDH (Audio Processor Prologic BBE High for DOLBY)	5	0	0	0
	VAR	15	VFIX	VFIX (AUDIO OUTPUT FIX DATA)	0	0	0	0
	VAR	16	AGCL	AGCL (AGC LEVEL)	2	2	2	2
	VAR	17	VCOF	RF OFFSET DATA	9	9	9	9

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC 21FA310	20FS120	21FM120	24FS120
AP2	VAR	1	BBEL	SUB AUDIO PROCESSOR PROLOGIC BBE LOW	2	0	0	0
	VAR	2	BBEH	SUB AUDIO PROCESSOR PROLOGIC BBE HIGH	5	0	0	0
	VAR	3	BBOL	SURROUND OFF-BBE LOW	2	0	0	0
	VAR	4	BBSL	SIMULATE BBE LOW	2	0	0	0
	VAR	5	BBGL	WOW GAME BBE LOW	3	0	0	0
	VAR	6	AGCL	SUB AUDIO PROCESSOR AGC LEVEL	2	0	0	0
	VAR	7	DDOF	DOLBY OFFSET DATA	15	0	0	0

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
MICROPROCESSOR	FIX	1	DISP	DISP (OSD HORIZONTAL OFFSET)	55
	FIX	2	CCHP	CCHP (FOR TILT DATA CALCULATION)	80
	FIX	3	HRLW	HRLW (LOW LIMIT OF H-PULSE COUNTING WINDOW [RF]	16
	FIX	4	HRHG	HRLG (HIGH LIMIT OF H-PULSE COUNTING WINDOW [RF]	64
	FIX	5	HSDT	HSDTCT (H-PULSE DETECTION [S-VIDEO]	8
	FIX	6	STPI	STPI (GRADUAL CONTRAST INCREASE STARTING LEVEL)	40
	FIX	7	RAPI	RAPI (GRADUAL CONTRAST INCREASE Vsync COUNTER)	10

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
Feature	VAR		ID0	Language related	81
	VAR		ID1	Video related	23
	VAR		ID2	Audio related	113
	VAR		ID3	Miscellaneous	130
	VAR		ID4	Miscellaneous	32
	VAR		ID5	Miscellaneous	16
	VAR		ID6	Miscellaneous	48
	VAR		ID7	Miscellaneous	69

4-5. ID MAP TABLE

Model	Destination	ID-O	ID-1	ID-2	ID-3	ID-4	ID-5	ID-6	ID-7
KV-20FS120	US	89	7	9	34	0	16	0	5
KV-20FS120	CND	89	7	9	50	0	16	0	5
KV-21FM120	L NORTH	81	3	0	130	32	16	48	69
KV-21FS120	L NORTH	81	7	9	130	32	16	48	69
KV-21FS120	L SOUTH	81	7	9	130	32	16	48	69
KV-21FA310	L NORTH	81	23	113	130	32	16	48	69
KV-21FA310	L SOUTH	81	23	113	130	32	16	48	69
KV-24FS120	US	89	23	9	34	0	16	0	5
KV-24FS120	CND	89	23	9	50	0	16	0	5
KV-25FS120	L NORTH	81	23	9	130	32	16	48	69
KV-25FS120	L SOUTH	81	23	9	130	32	16	48	69

4-6. A BOARD ADJUSTMENTS

H. Frequency (Free Run) Check

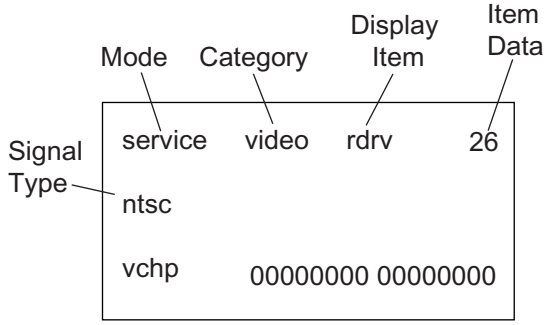
1. Input a TV mode (RF) with no signal.
2. Connect a frequency counter to base of Q502 (TP-25 H. DRIVE) on the A Board.
3. Check H. Frequency for 15735 ± 200 Hz.

V. Frequency (Free Run) Check

1. Select video 1 with no signal input.
2. Set the conditions for a standard setting.
3. Connect the frequency counter to TP-27 (V OUT) or CN515 pin ⑥ (V DY+) and ground on the A Board .
4. Check that V. Frequency shows 60 ± 4 Hz.

Drive (SCON)

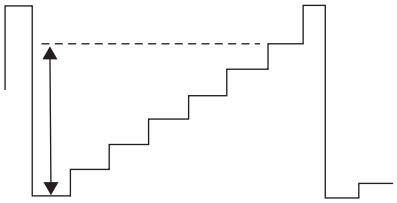
1. Input a color-bar signal and set the level to 75%.
2. Set in Pro mode + PICTURE MAX.
3. Activate the Service Adjustment Mode.



R ON:	ON	(1)
G ON:	OFF	(0)
B ON:	OFF	(0)

4. Connect an oscilloscope probe to CV Board, J1751Pin 12 (KR) (Red Out) .
5. Select SCON with 1 and 4 .
6. Adjust the value of SCON with 3 and 6 for 86 ± 3Vpp for 20/21 inch, and 96 ± 3Vpp for 24/25 inch.

76 – 3Vpp for 20/21 inch
82 – 3Vpp for 24/25 inch

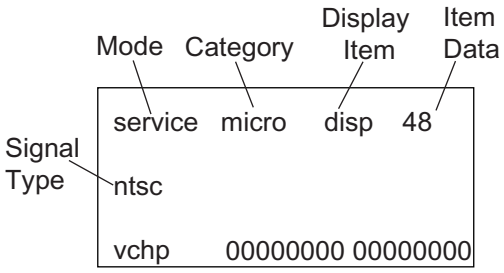


R ON:	ON	(1)
G ON:	ON	(1)
B ON:	ON	(1)

7. Press MUTING then ENTER to save into the memory.

Display Position Adjustment (DISP)

1. Input a color-bar signal.
2. Set to Service Adjustment Mode.
3. Select DISP with 1 and 4 .
4. Adjust values of DISP with 3 and 6 to adjust characters to the center.
5. Press MUTING then ENTER to save into the memory.
6. Check to see if the text is displayed on the screen.

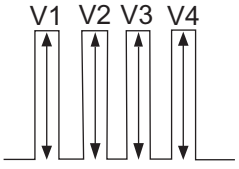


Sub Bright Adjustment (SBRT)

1. Input a monoscope signal.
2. Activate the Service Adjustment Mode.
3. Set the PICTURE and BRIGHTNESS to minimum.
4. Select the SBRT item with 1 and 4 .
5. Adjust the values of SBRT with 3 and 6 to obtain a faintly visible crosshatch.
6. Press MUTING then ENTER to save into the memory.

Sub Hue, Sub Color Adjustment (SHUE, SCOL)

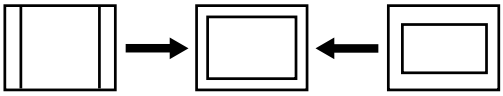
1. Input color-bar signal at 75%.
2. Activate the Service Adjustment Mode.
3. Set (PIC) to Max and (COL) to 50%.
4. Connect an oscilloscope probe to CV Board, CN301Pin ④ Blue Out.
5. Select the SHUE and SCOL item with 1 and 4 .
6. While showing the SHUE item, adjust the waveform with 3 and 6 until the second and third bars show the same level (V2 = V3 < 0.15Vp-p). Set Sub Hue -2 Step.
7. While showing the SCOL item, adjust the waveform with 3 and 6 until the first and fourth bars show the same level (V1 = V4 < 0.15Vp-p). Set Sub Col +3 Step.



8. Press MUTING then ENTER to save into the memory.

V. Size Adjustment (VSIZ)

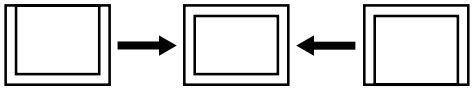
1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the VSIZ item with 1 and 4 .
4. Adjust value of VPOS with 1 and 4 for the best vertical center.
5. Press MUTING then ENTER to save into the memory.



V. Center Adjustment (VPOS)

Perform this adjustment after performing H. Frequency (Free Run) Check.

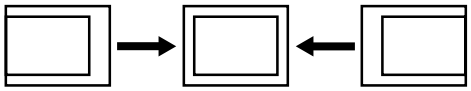
1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the VPOS item with 1 and 4 .
4. Adjust value of VPOS with 3 and 6 for the best vertical center.
5. Press MUTING then ENTER to save into the memory.



H. Center Adjustment (HPOS)

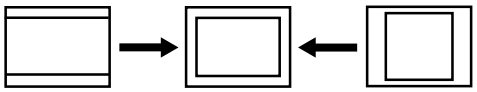
Perform this adjustment after performing H. Frequency (Free Run) Check.

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the HPOS item with 1 and 4 .
4. Adjust the value of HPOS with 3 and 6 for the best horizontal center.
5. Press MUTING then ENTER to save into the memory.



H. Size Adjustment (HSIZ)

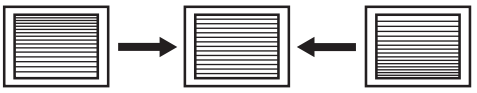
1. Input a monoscope signal.
2. Activate the Service Adjustment Mode.
3. Select HSIZ with 1 and 4 .
4. Adjust with 3 and 6 for the best horizontal size.
5. Press MUTING then ENTER to save into the memory.



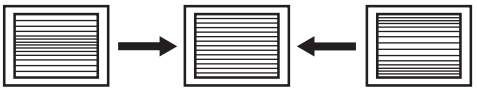
V. Linearity (VLIN), V. Correction (SCOR), PIN Amp (PAMP), and Horizontal Trapezoid (HTRP) Adjustments

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select VLIN, SCOR, PAMP, and HTRP with with 1 and 4.
4. Adjust with 3 and 6 for the best horizontal size.
5. Press MUTING then ENTER to save into the memory.

V LINEARITY (VLIN)

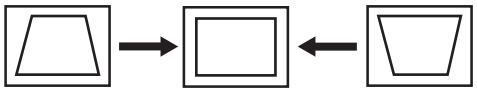


V CORRECTION (SCOR)



PIN AMP (PAMP)

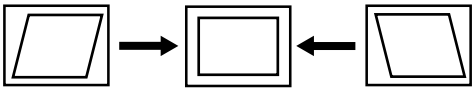
HORIZONTAL TRAPEZOID (HTRP)



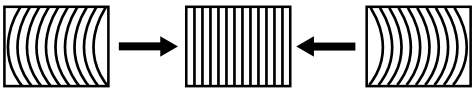
V. Angle (VANG), V. Bow (VBOW), Upper PIN (UPIN) and Low PIN (LPIN) Adjustments

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select VANG, VBOW, UPIN, and LPIN with 1 and 4.
4. Adjust with 3 and 6 for the best picture.
5. Press MUTING then ENTER to save into the memory.

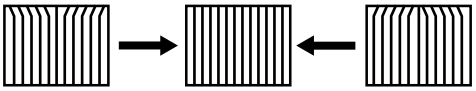
V ANGLE (VANG)



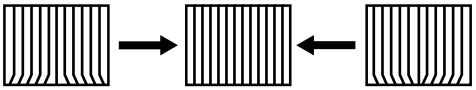
V BOW (VBOW)



UPPER PIN (UPIN)



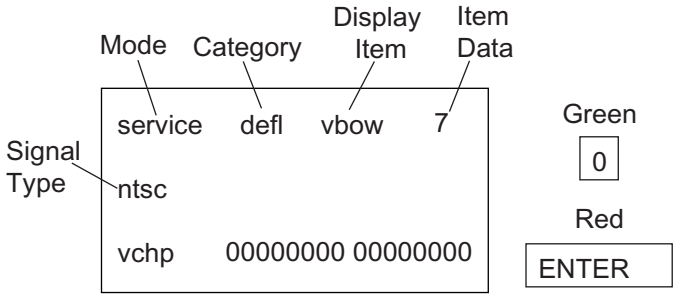
LOW PIN (LPIN)



Service Adjustment Mode Memory

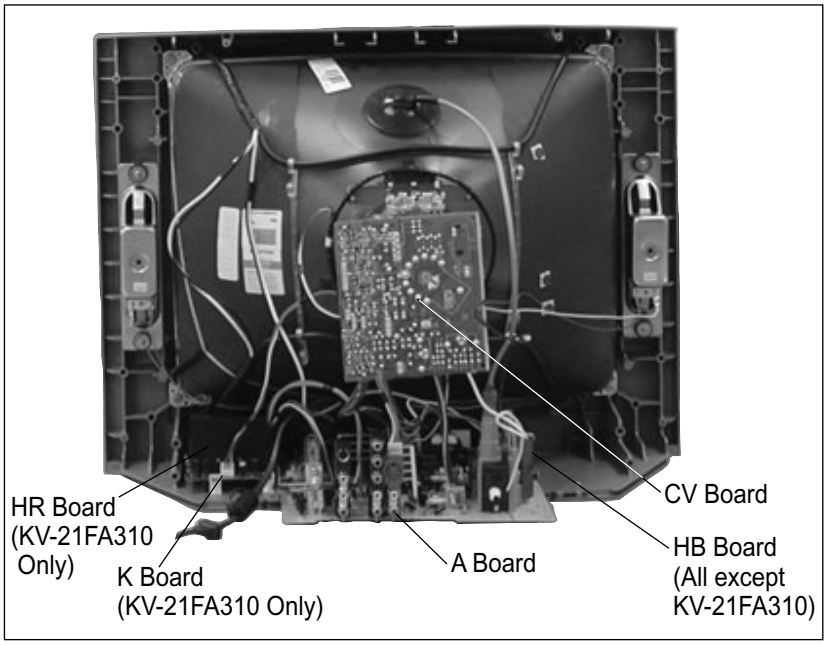
1. After completing all adjustments, press 0 then ENTER .

Read From Memory



SECTION 5: DIAGRAMS

5-1. CIRCUIT BOARDS LOCATION



The components identified by shading and ⚠ symbol are critical for safety. Replace only with part number specified.

The symbol ▬ indicates a fast operating fuse and is displayed on the component side of the board. Replace only with fuse of the same rating as marked.

Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

Le symbole ▬ indique une fusible a action rapide. Doit etre remplace par une fusible de meme yaleur, comme maque.

The components identified by ⋈ in this basic schematic diagram have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be necessary, replace only with the value originally used.

5-2. PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM INFORMATION

All capacitors are in µF unless otherwise noted. pF : µµF 50WV or less are not indicated except for electrolytics and tantalums.

All electrolytics are in 50V unless otherwise specified.

All resistors are in ohms. k=1000, M=1000k

Indication of resistance, which does not have one for rating electrical power, is as follows: Pitch : 5mm Rating electrical power :

$^1/_4$ W in resistance, $^1/_{10}$ W and $^1/_8$ W in chip resistance.

: nonflammable resistor.

: fusible resistor.

△ : internal component.

▭ : panel designation and adjustment for repair.

⊥ : earth ground

⏚ : earth-chassis

All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

Readings are taken with a color-bar signal input.

Readings are taken with a 10M digital multimeter.

Voltages are DC with respect to ground unless otherwise noted.

Voltage variations may be noted due to normal production tolerances.

All voltages are in V.

S : Measurement impossibillity.

: B-line. (Actual measured value may be different).

: signal path. (RF)

Circled numbers are waveform references.

When replacing components identified by ◪, make the necessary adjustments as indicated. If the results do not meet the specified value, change the component identified by ⋈ and repeat the adjustment until the specified value is achieved.
(Refer to Section 3: Safety Related Adjustments on Page 17.)

When replacing the parts listed in the table below, it is important to perform the related adjustments.

Part Replaced (◪)	Adjustment (⋈)
DY, T585, CRT, IC001, IC561, IC600, C506, C507, C508, T511, L510, C588, L588, C566, C561, C563, D567, D568, D566, PH602, R567, R568, R565, R566, R562, R563, R561, R528…….....A Board	HV HOLD-DOWN RV565

REFERENCE INFORMATION

RESISTOR

: RN	METAL FILM
: RC	SOLID
: FPRD	NONFLAMMABLE CARBON
: FUSE	NONFLAMMABLE FUSIBLE
: RW	NONFLAMMABLE WIREWOUND
: RS	NONFLAMMABLE METAL OXIDE
: RB	NONFLAMMABLE CEMENT
: ※	ADJUSTMENT RESISTOR

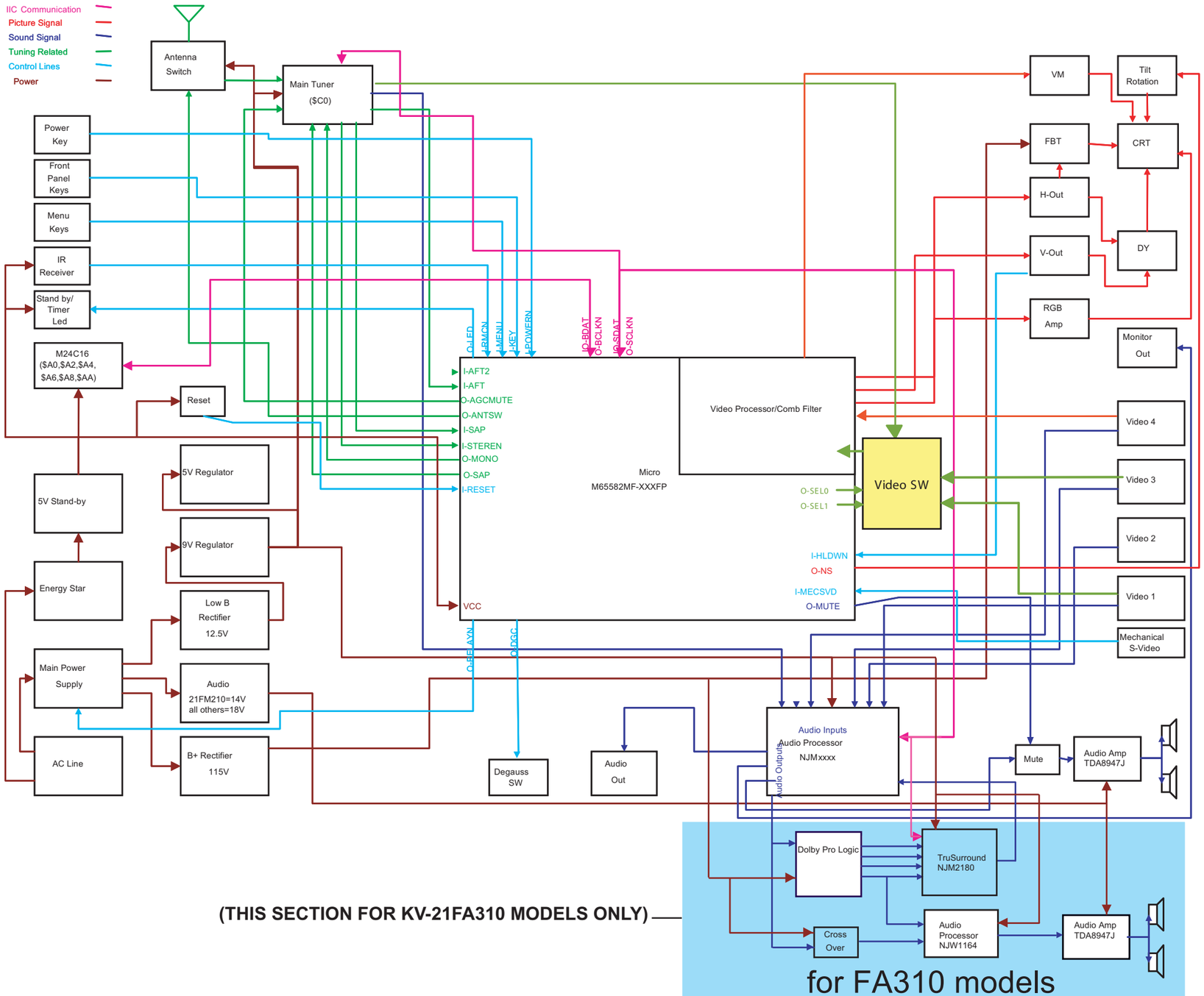
COIL

: LF-8L	MICRO INDUCTOR

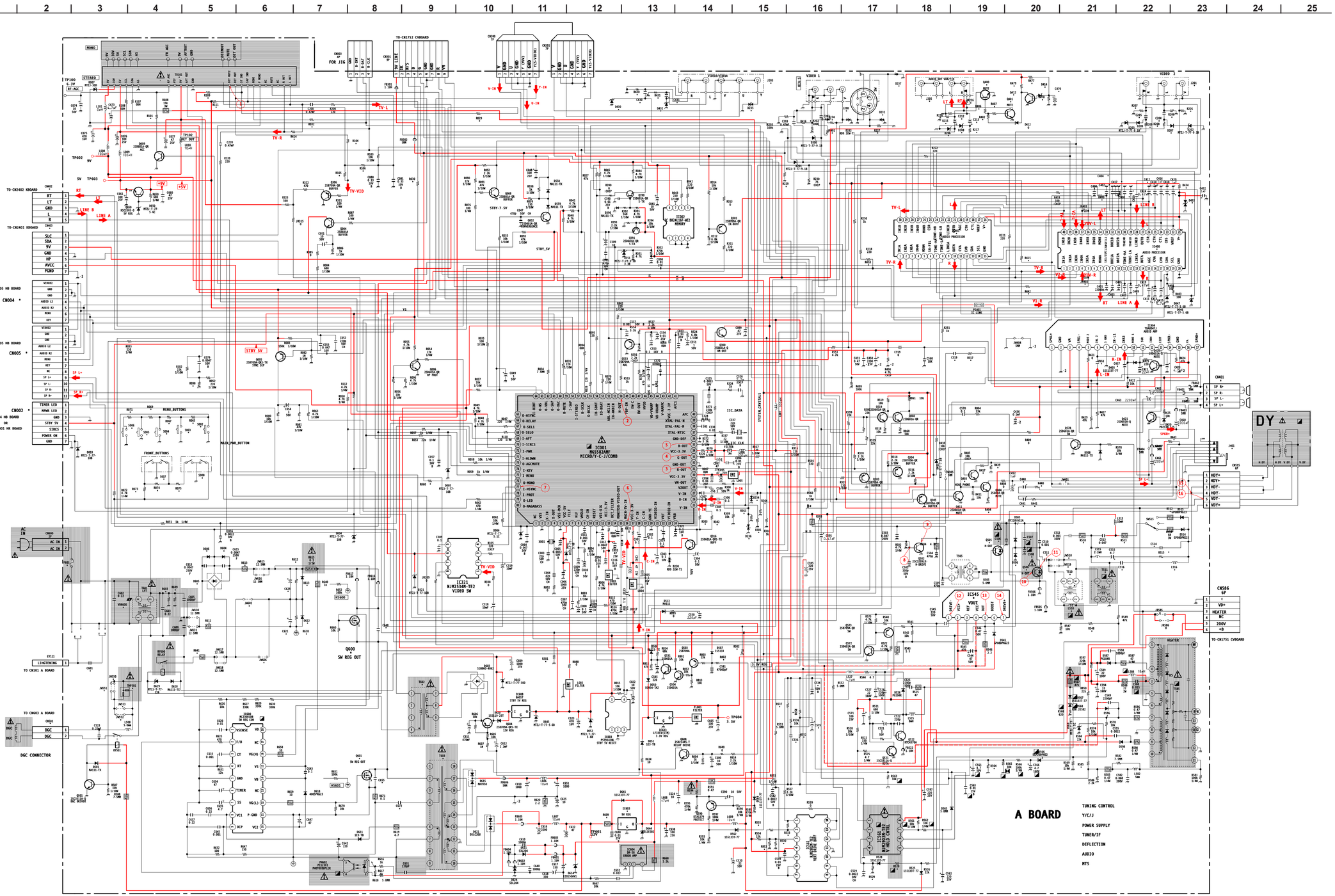
CAPACITOR

: TA	TANTALUM
: PS	STYROL
: PP	POLYPROPYLENE
: PT	MYLAR
: MPS	METALIZED POLYESTER
: MPP	METALIZED POLYPROPYLENE
: ALB	BIPOLAR
: ALT	HIGH TEMPERATURE
: ALR	HIGH RIPPLE

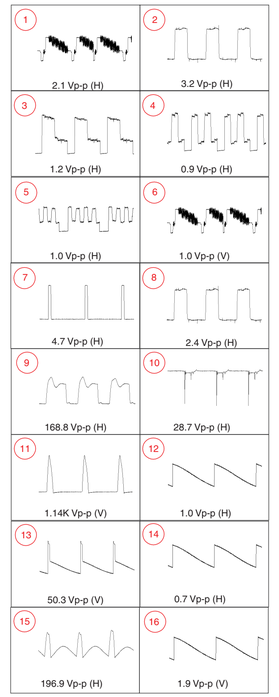
5-3. BLOCK DIAGRAM AND SCHEMATICS



A BOARD SCHEMATIC DIAGRAM

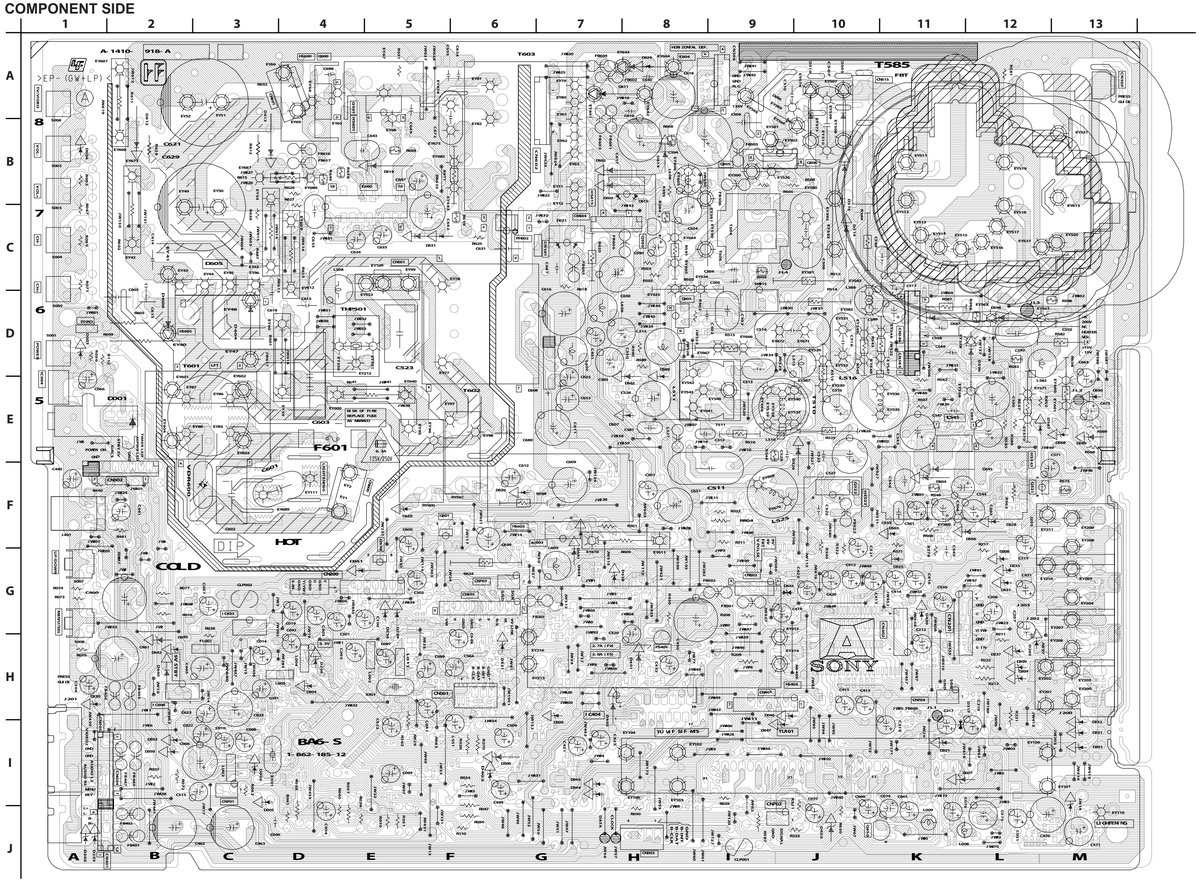


A BOARD WAVEFORMS



A [TUNING CONTROL, Y-C JUNGLE, POWER SUPPLY, TUNER/IF, DEFLECTION, AUDIO, MTS]

COMPONENT SIDE



A BOARD IC VOLTAGE LIST

IC001					IC321					IC545		IC600		IC608	
PIN	VOLT	31	2.9	63	1.4	PIN	VOLT	24	3.9	17	4.5	PIN	VOLT	PIN	VOLT	PIN	VOLT
1	N/C	33	2.8	65	4.9	1	4.5	26	0.6	19	3.9	1	0.7	1	2.5	I	11.0
2	GND	34	3.3	66	0.0	2	0.3	27	4.5	20	0.6	2	13.5	2	1.8	O	5.0
3	2.2	35	2.9	67	0.1	3	4.5	28	4.5	21	4.5	3	-12.2	3	2.2	G	GND
4	2.2	36	GND	68	0.1	4	0.4	29	4.5	22	N/C	4	-13.3	4	2.5	IC633	
5	GND	37	1.8	69	2.4	5	4.5	30	4.5	23	4.5	5	0.2	5	GND	PIN	VOLT
6	5.0	38	0.0	70	5.0	6	9.0	31	4.5	24	4.5	6	13.8	6	0.0	I	9.0
7	0.0	39	0.1	71	5.0	7	4.4	32	4.5	25	4.5	7	0.7	7	4.0	G	GND
8	2.0	40	2.0	72	0.1	8	GND	33	4.5	26	N/C	IC561		8	17.2	O	3.3
9	0.3	41	1.6	73	0.0	IC400		34	N/C	27	4.5	PIN	VOLT	9	GND		
10	2.1	42	3.3	74	5.0	PIN	VOLT	35	N/C	28	4.5	1	0.1	10	10.4		
11	5.0	43	N/C	75	5.0	1	4.5	36	N/C	29	4.5	2	3.4	11	0.0		
12	GND	44	1.6	76	5.0	2	4.5	37	4.5	30	4.5	3	2.3	12	4.6		
13	3.3	45	1.6	77	0.1	3	4.5	38	4.5	IC404		4	GND	13	N/C		
14	3.1	46	2.3	78	0.0	4	4.5	39	4.5	PIN	VOLT	5	9.2	14	163.6		
15	1.0	47	1.0	79	4.9	5	N/C	40	4.5	1	8.3	6	10.2	15	153.5		
16	1.5	48	N/C	80	4.9	6	N/C	IC401		2	GND	7	0.1	16	157.6		
17	3.3	49	0.5	IC002		7	N/C	PIN	VOLT	3	19.6	8	13.5	17	N/C		
18	0.5	50	1.2	PIN	VOLT	8	4.5	1	4.5	4	8.3	IC565		18	340.0		
19	1.1	51	2.0	1	GND	9	4.5	2	4.5	5	19.6	PIN	VOLT	IC603			
20	GND	52	1.5	2	GND	10	4.5	3	4.5	6	3.2	1	3.4	PIN	VOLT		
21	0.5	53	4.8	3	GND	11	4.5	4	4.5	7	0.0	2	3.4	I	12.0		
22	1.7	54	4.8	4	GND	12	4.5	5	n/c	8	0.0	3	2.1	G	GND		
23	0.5	55	4.8	5	4.8	13	4.5	6	4.5	9	3.2	4	9.0	O	9.0		
24	0.5	56	4.8	6	4.8	14	4.5	7	4.5	10	9.1	5	1.0	IC604			
25	0.5	57	N/C	7	GND	15	0.6	8	4.5	11	9.7	6	1.0	PIN	VOLT		
26	0.0	58	5.2	8	5.0	16	3.5	9	n/c	12	3.2	7	1.0	1	133.7		
27	0.0	59	0.0	IC003		17	3.5	10	4.5	13	3.3	8	1.6	2	N/C		
28	2.1	60	0.0	PIN	VOLT	18	4.8	11	3.5	14	8.3	9	1.6	3	2.5		
29	2.7	61	0.0	1	N/C	19	4.8	12	3.5	15	GND	10	1.6	4	11.3		
30	3.3	62	0.0	2	GND	20	GND	13	4.8	16	19.6	11	GND	5	GND		
				3	GND	21	**9**	14	4.8	17	8.3	12	1.6				
				4	5.0	22	4.5	15	GND			13	1.6				
				5	5.0	23	3.8	16	9.0			14	1.6				

All voltages are in V.

A BOARD TRANSISTOR VOLTAGE LIST

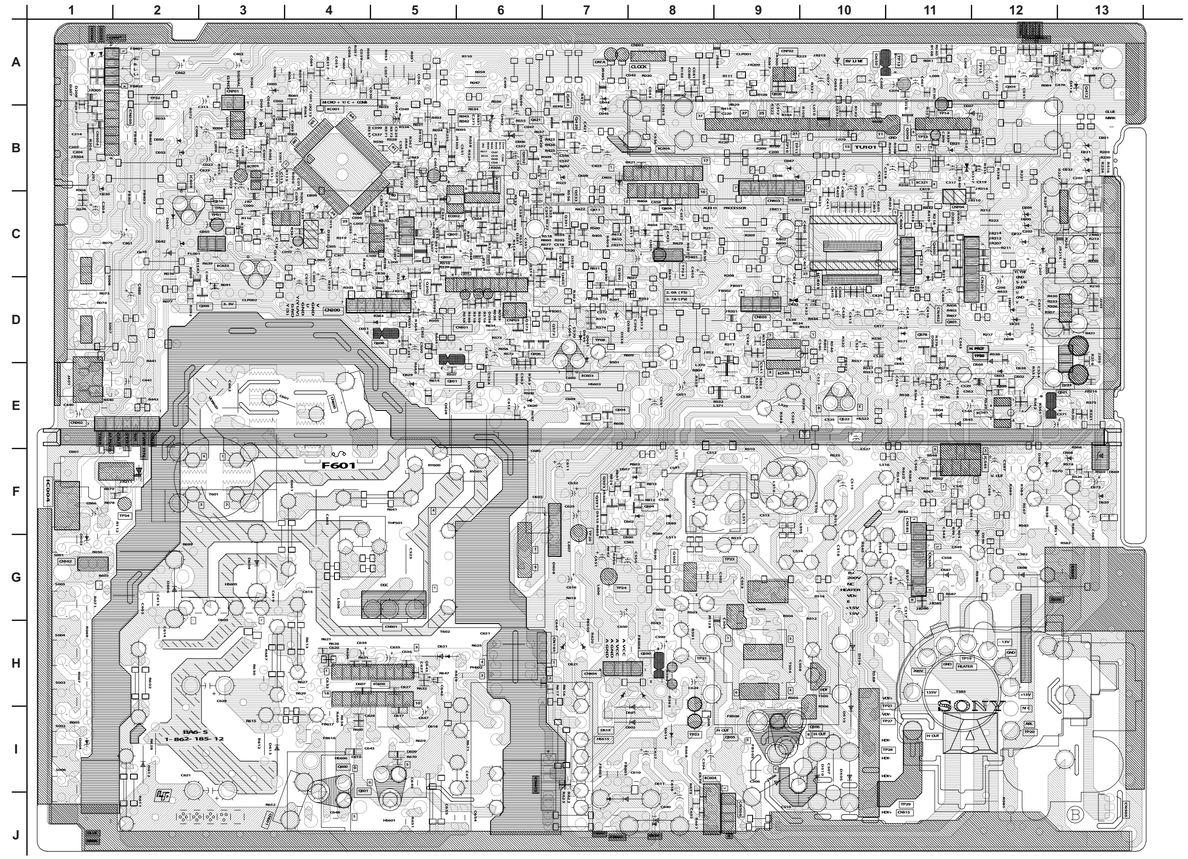
	B	C	E		B	C	E
Q002	0.0	2.0	GND	**Q501**	0.0	14.3	GND
Q004	3.8	9.0	4.4	**Q502**	0.0	74.1	GND
Q005	5.1	0.8	5.0	**Q503**	2.9	0.0	9.0
Q006	0.0	0.0	GND	**Q504**	0.0	0.0	GND
Q008	0.0	2.6	GND	**Q505**	0.0	131.8	0.0
Q009	0.0	5.2	GND	**Q506**	0.0	131.8	0.0
Q300	1.8	9.0	2.4	**Q519**	0.0	3.8	GND
Q301	3.6	2.1	3.6	**Q521**	0.0	3.8	GND
Q303	3.6	GND	2.8	**Q522**	0.1	-2.1	0.0
Q304	3.6	GND	2.9	**Q531**	0.0	0.0	GND
Q305	3.6	GND	3.0	**Q533**	1.5	GND	1.5
Q306	5.5	GND	4.9	**Q572**	0.0	2.6	GND
Q316	0.0	3.3	0.0	**Q573**	2.6	0.0	2.6
Q390	0.8	1.5	1.9	**Q578**	0.0	0.5	GND
Q391	0.6	3.3	1.5	**Q590**	133.7	0.0	134.2
Q400	0.0	0.1	GND	**Q604**	30.6	11.6	30.2
Q401	0.0	0.1	GND	**Q608**	0.0	6.7	GND
Q403	0.0	0.7	0.0	**Q650**	5.8	9.0	5.0
Q404	0.0	0.0	GND	**Q860**	3.9	5.7	3.3
Q411	0.0	5.8	GND				
Q412	0.1	0.1	GND				

All voltages are in V.

	D	G	S
Q600	313.0	160.0	156.0
Q601	155.0	4.9	0.0

A [TUNING CONTROL, Y-C JUNGLE, POWER SUPPLY, TUNER/IF, DEFLECTION, AUDIO, MTS]

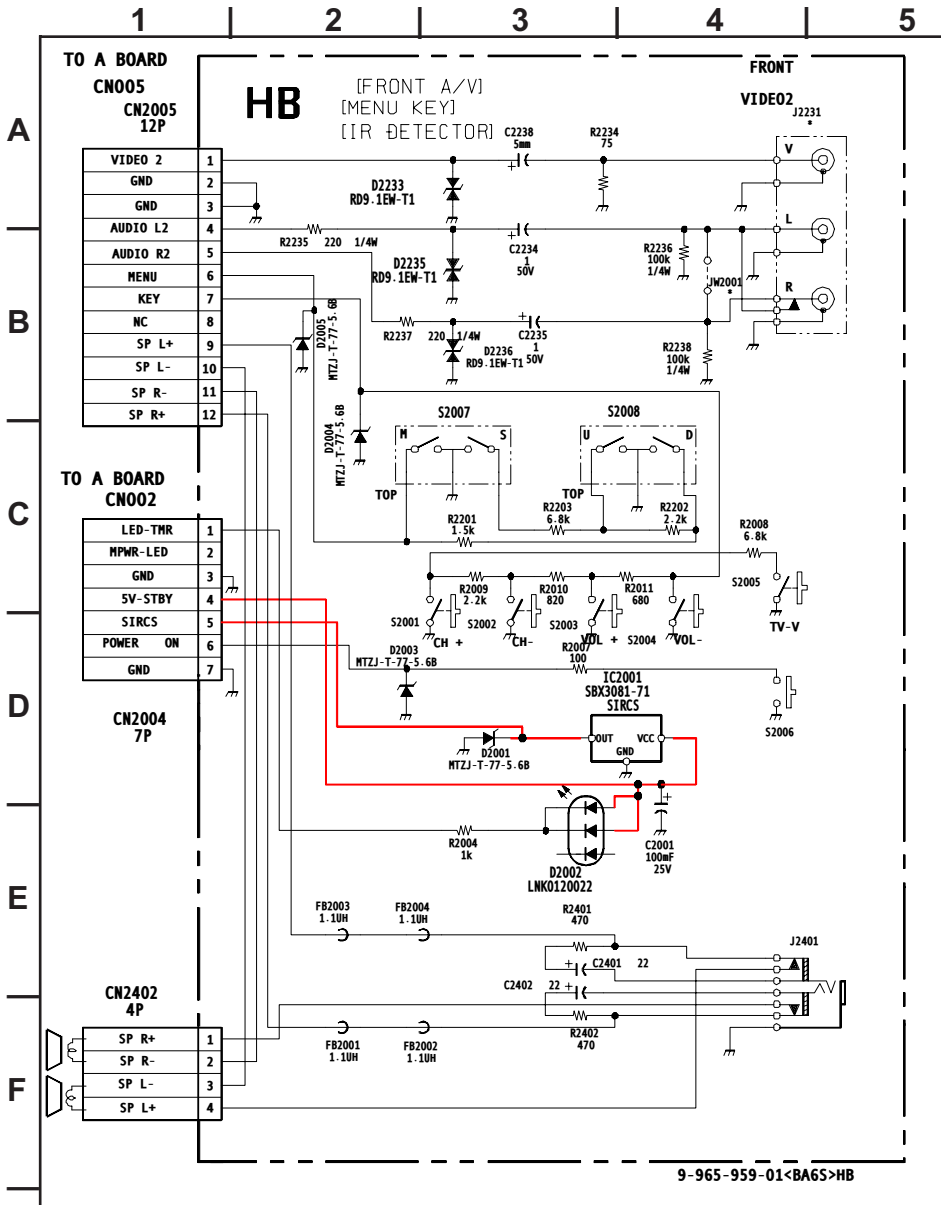
CONDUCTOR SIDE



A BOARD LOCATOR LIST CONDUCTOR SIDE

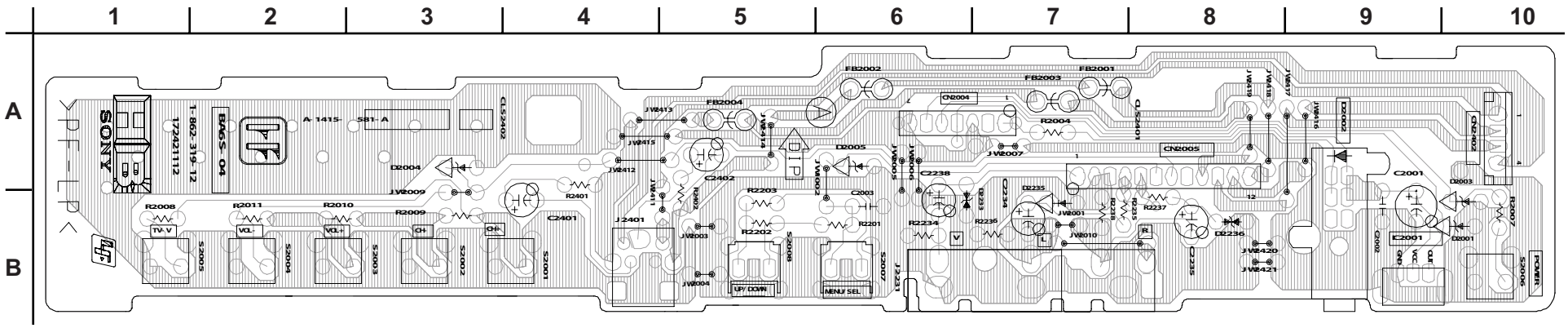
DIODE		DIODE		DIODE		IC		TRANSISTORS	
D002	B3	D317	B11	D563	D11	IC001	B4	Q391	C7
D003	G1	D321	B11	D566	E12	IC002	C5	Q400	C11
D004	I1	D351	C6	D567	F12	IC003	B3	Q401	D11
D005	A3	D390	D8	D568	F13	IC321	B11	Q403	A7
D006	B6	D401	C8	D569	F13	IC400	C10	Q404	C8
D007	B11	D405	B7	D587	G11	IC401	C10	Q411	C7
D045	B7	D412	A13	D589	F8	IC404	B8	Q412	A13
D046	B9	D414	A13	D596	G12	IC545	F11	Q420	B7
D047	B9	D420	B6	D598	G12	IC561	E12	Q421	B6
D050	B2	D430	D11	D603	F7	IC565	E9	Q501	E6
D051	D4	D431	D12	D604	G3	IC600	H5	Q502	G8
D052	B2	D432	D9	D605	G3	IC603	D7	Q503	F7
D200	C12	D500	G7	D606	G3	IC604	I9	Q504	F8
D201	B13	D501	E6	D611	J8	IC608	B2	Q505	I9
D202	A1	D505	I10	D612	I2	IC633	C3	Q506	I10
D203	A1	D506	I9	D613	I4	TRANSISTORS		Q519	C7
D204	B12	D507	F8	D614	I8	Q002	B6	Q521	E12
D205	C12	D508	D11	D615	I7	Q004	A12	Q522	E10
D206	C11	D510	I10	D618	I5	Q005	A12	Q531	F7
D207	A11	D513	F7	D620	E6	Q006	D7	Q533	C7
D208	D12	D514	H10	D621	H7	Q008	D3	Q572	D7
D209	A1	D515	H10	D624	J8	Q009	B11	Q573	D6
D230	C1	D525	D11	D628	E5	Q300	D5	Q578	D11
D231	B13	D526	E10	D629	E5	Q301	C6	Q590	H8
D232	B13	D528	E12	D631	H6	Q303	C5	Q600	I4
D234	D5	D545	E11	D641	D7	Q304	D6	Q601	I5
D235	D12	D558	D6	D642	C2	Q305	C6	Q604	E8
D236	D5	D559	C7	D644	D7	Q306	B9	Q608	D5
D237	C12	D562	F8	D645	C2	Q316	C3	Q650	A10
				D650	B10	Q390	D7	Q860	C7

HB BOARD SCHEMATIC DIAGRAM (ALL EXCEPT KV-21FA310)



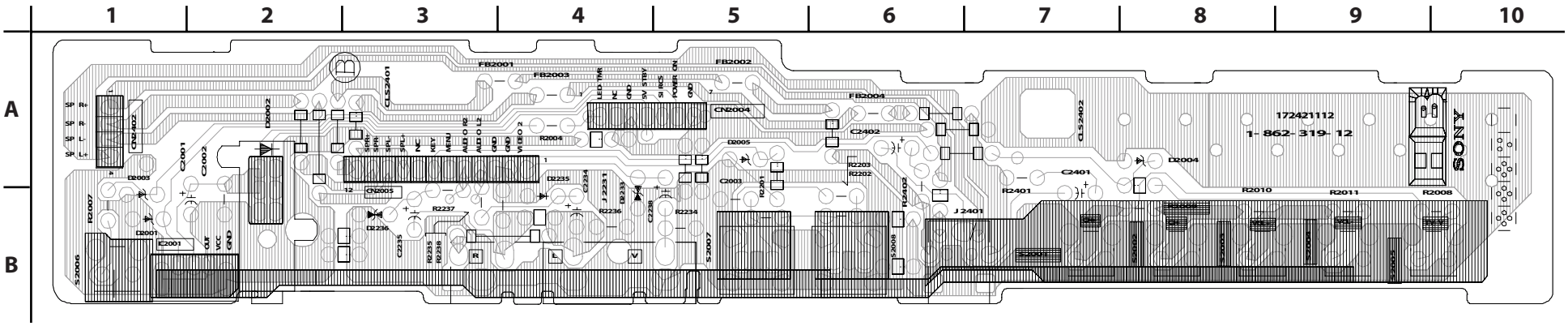
HB [FRONT A/V, MENU KEY, IR DETECTOR]

COMPONENT SIDE (ALL EXCEPT KV-21FA310)

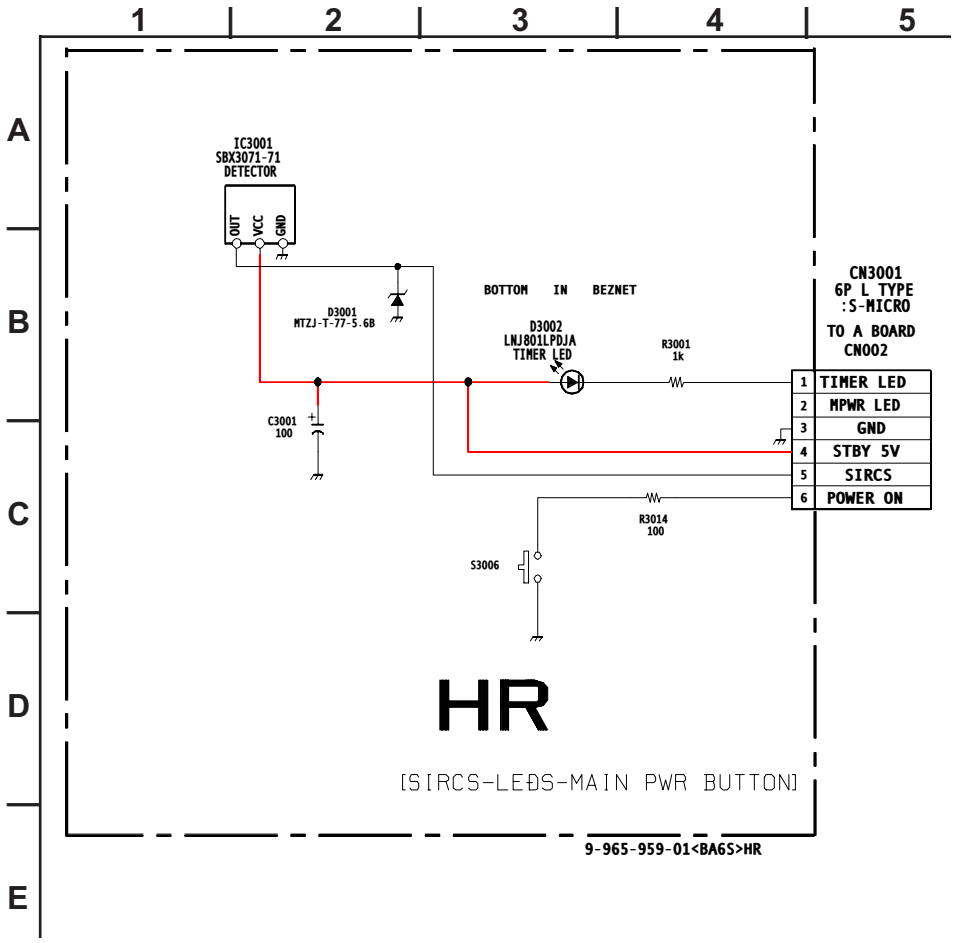


HB [FRONT A/V, MENU KEY, IR DETECTOR]

CONDUCTOR SIDE (ALL EXCEPT KV-21FA310)

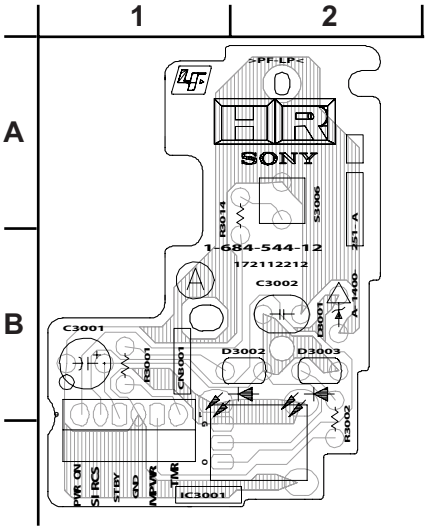


HR BOARD SCHEMATIC DIAGRAM (KV-21FA310 ONLY)



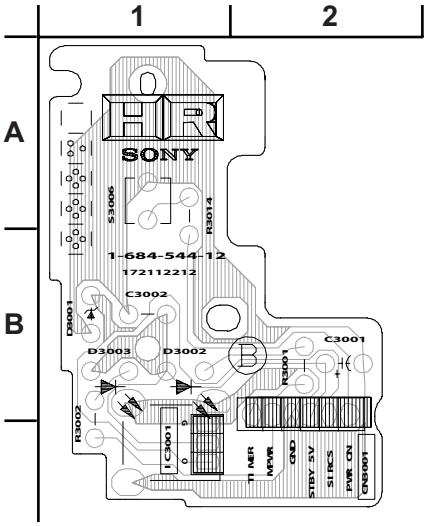
HR [SIRCS, LEDS, MAIN PWR BUTTON]

COMPONENT SIDE (KV-21FA310 ONLY)

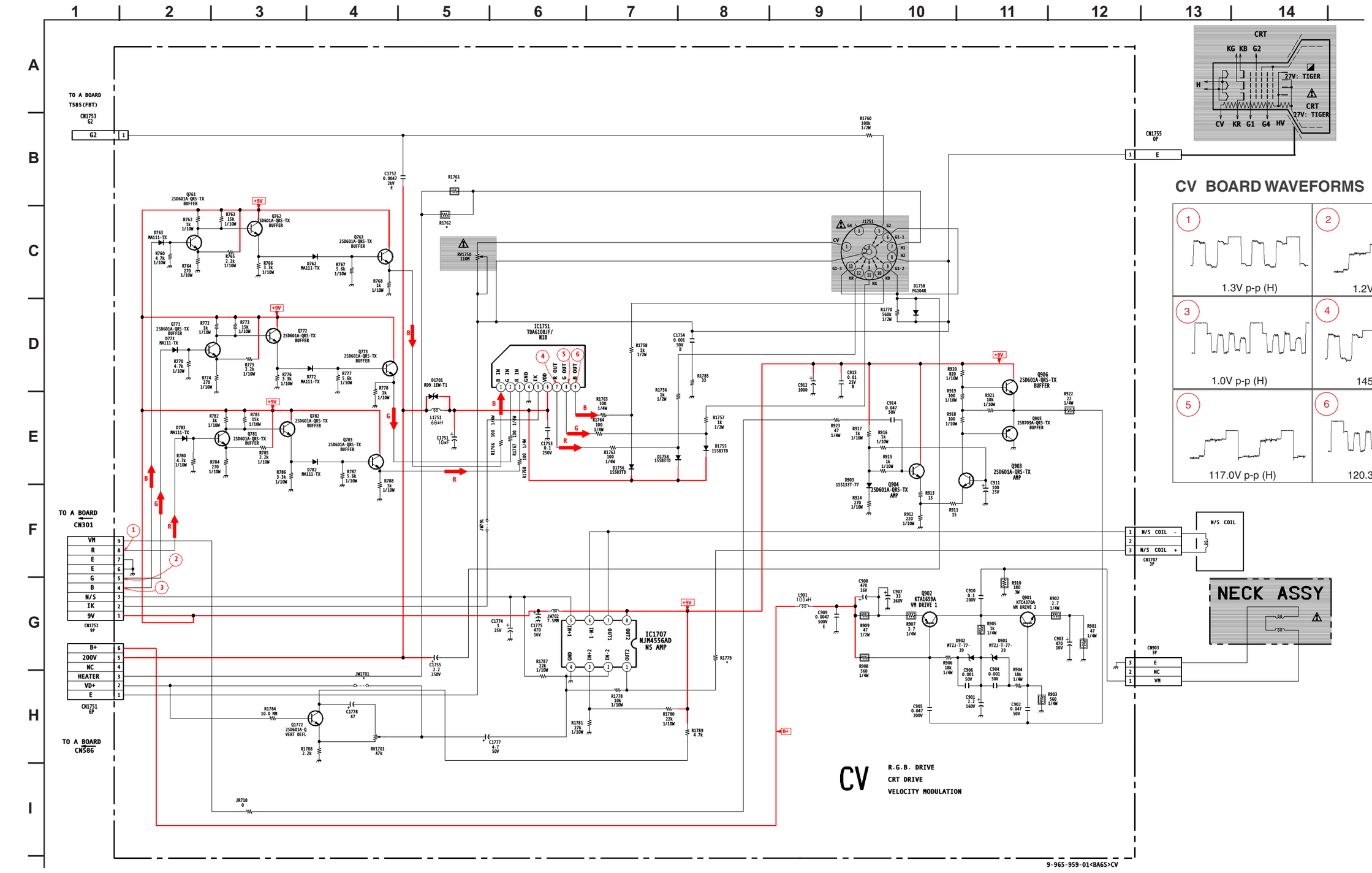


HR [SIRCS, LEDS, MAIN PWR BUTTON]

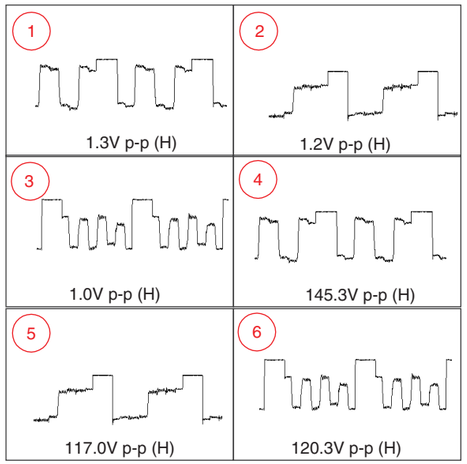
CONDUCTOR SIDE (KV-21FA310 ONLY)



CV BOARD SCHEMATIC DIAGRAM



CV BOARD WAVEFORMS



CV BOARD IC VOLTAGE LIST

IC701		IC1751	
PIN	**VOLT**	**PIN**	**VOLT**
1	1.8	1	2.0
2	2.8	2	2.0
3	4.4	3	2.4
4	GND	4	GND
5	4.8	5	3.7
6	4.8	6	200.0
7	4.8	7	136.0
8	9.0	8	142.0
		9	140.0

All voltages are in V.

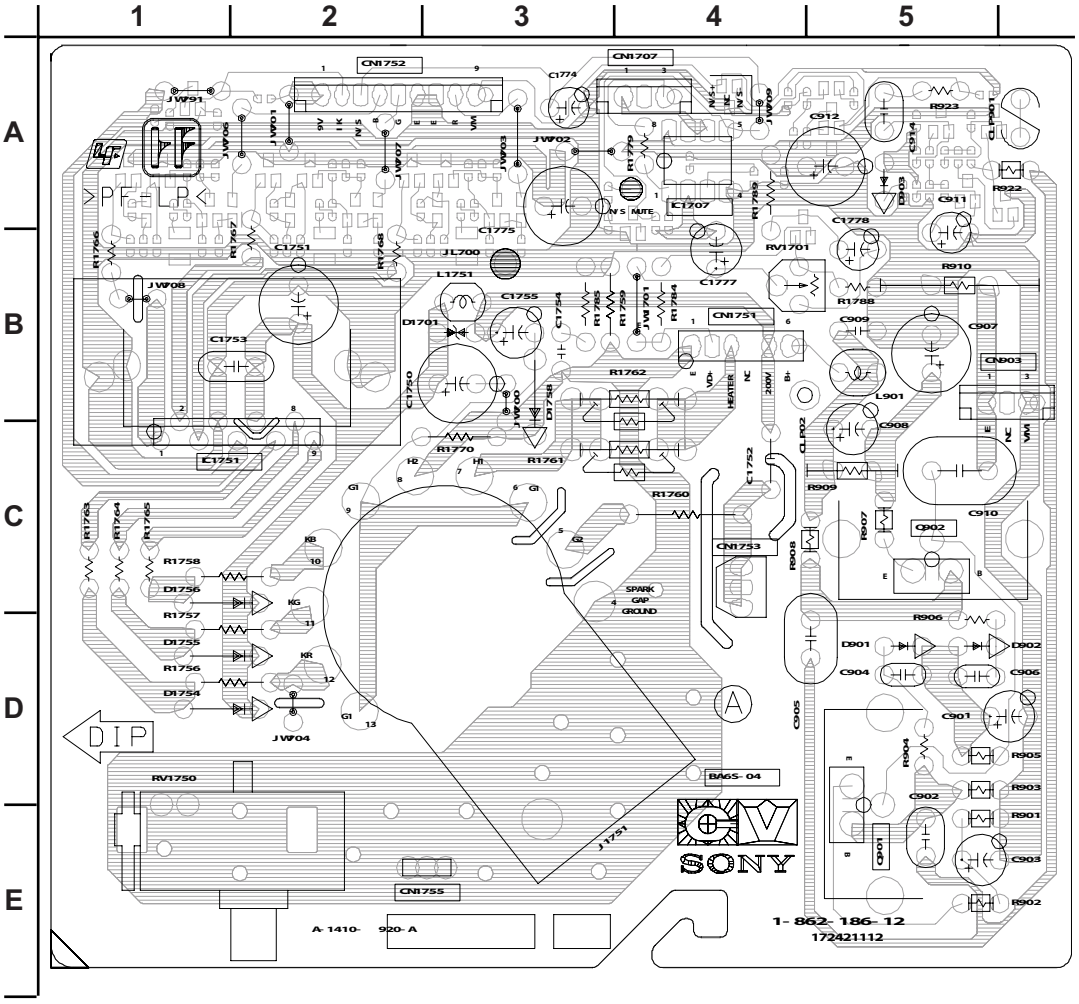
CV BOARD TRANSISTOR LIST

	B	C	E		B	C	E
Q761	2.2	3.8	2.9	**Q783**	2.1	9.0	2.7
Q762	3.1	9.0	3.8	**Q901**	0.9	67.0	0.4
Q763	2.0	9.0	2.6	**Q902**	134.0	67.0	134.0
Q771	2.2	3.8	2.9	**Q903**	1.8	5.4	2.4
Q772	3.2	9.0	3.8	**Q904**	1.8	9.0	2.4
Q773	2.0	9.0	2.6	**Q905**	5.7	GND	5.4
Q781	2.2	3.9	2.9	**Q906**	5.7	9.0	6.1
Q782	3.3	9.0	3.9	**Q1772**	0.0	0.0	0.0

All voltages are in V.

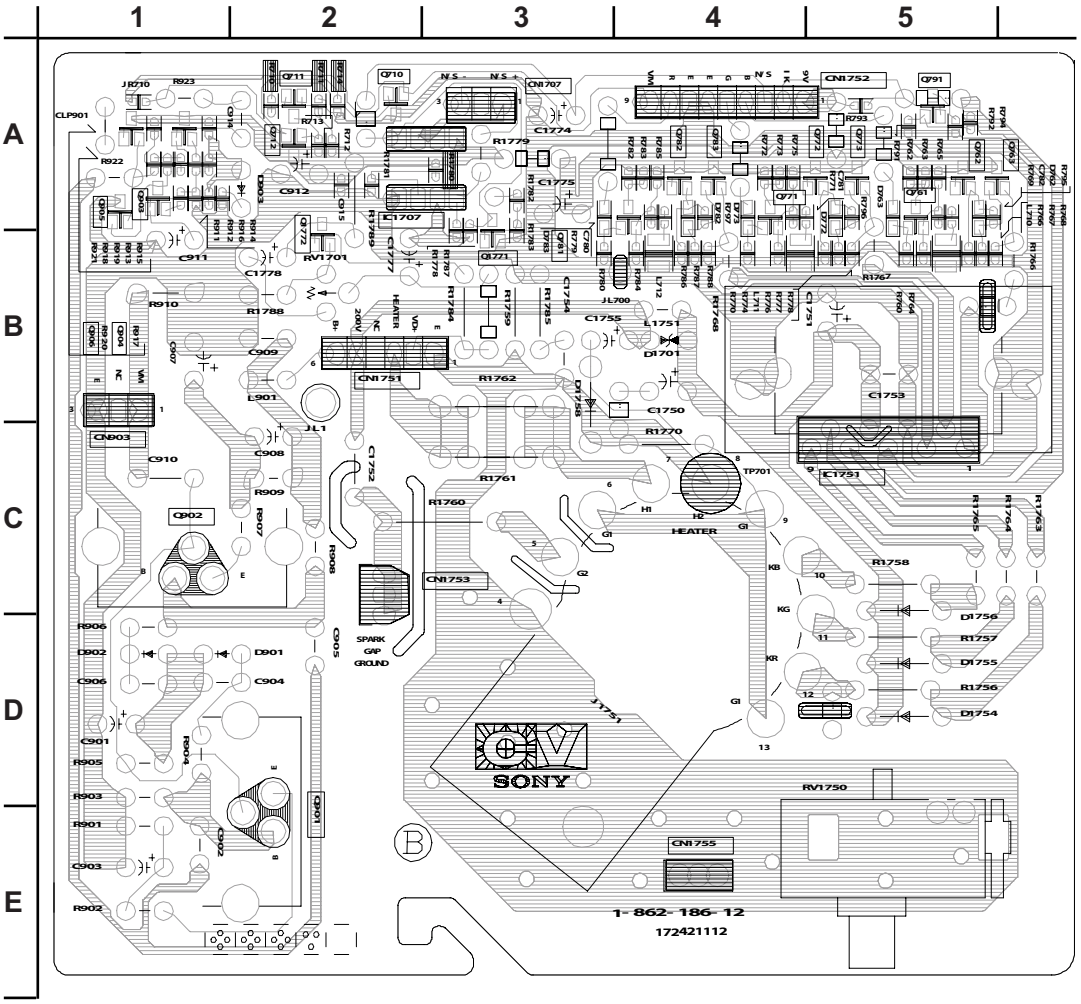
CV [RGB DRIVE, CRT DRIVE, VELOCITY MODULATION]

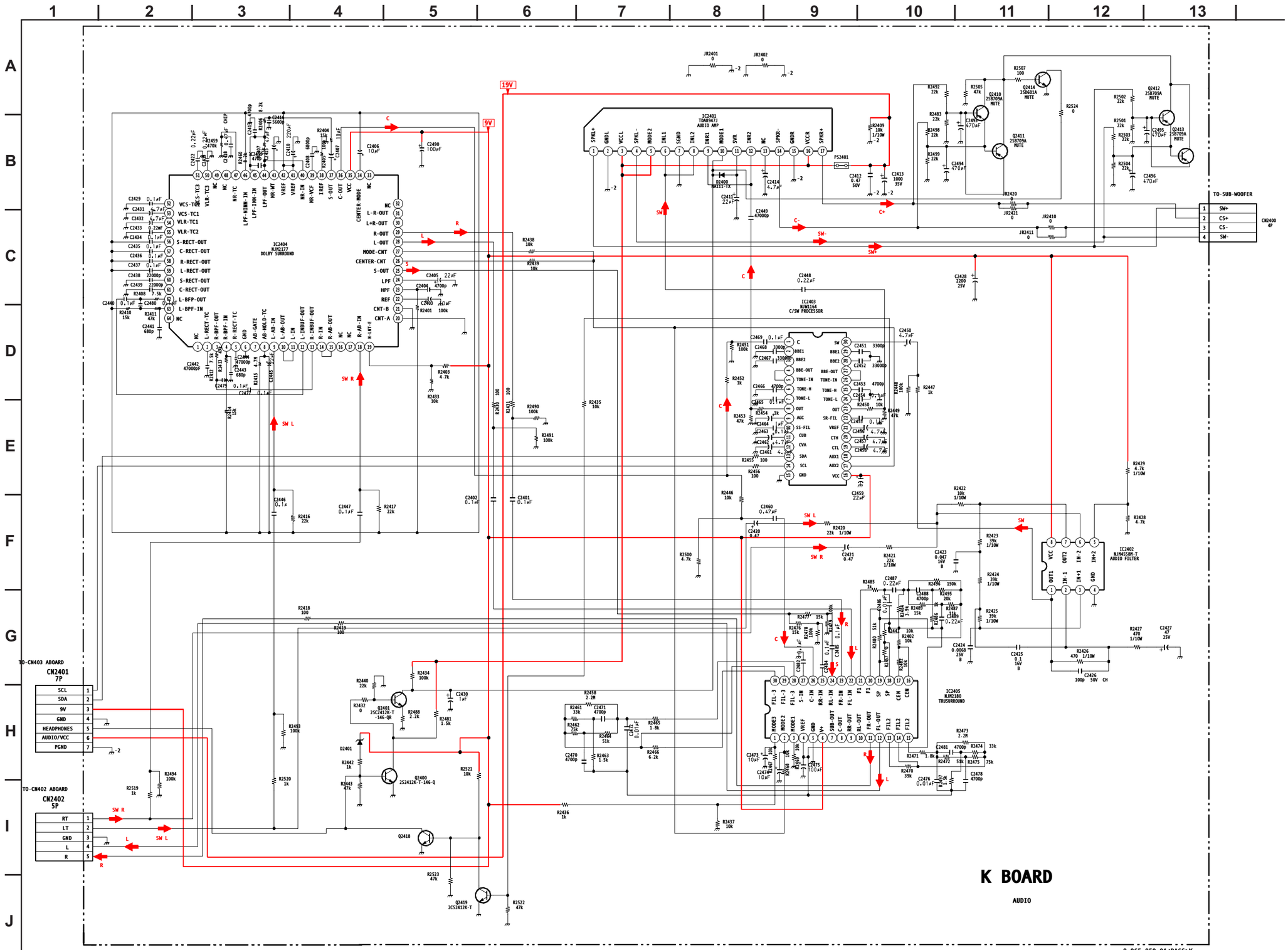
COMPONENT SIDE



CV [RGB DRIVE, CRT DRIVE, VELOCITY MODULATION]

CONDUCTOR SIDE




IC2404
NJM2177
DOLBY SURROUND
IC2401
TDA8947J
AUDIO AMP
IC2403
NJW1164
C/SW PROCESSOR
IC2405
NJM2180
TRUSURROUND
IC2402
NJM4558M-T
AUDIO FILTER
Q2400
2S2412K-T-146-Q
Q2401
2SC2412K-T
-146-QR
Q2410
2SB709A
MUTE
Q2411
2SB709A
MUTE
Q2412
2SB709A
MUTE
Q2413
2SB709A
MUTE
Q2414
2SD601A
MUTE
Q2418
Q2419
2CS2412K-T
PS2401
D2400
RA111-TX
TO-SUB-WOOFER
CN2400
4P
1 SW+
2 CS+
3 CS-
4 SW-
TO-CN403 ABOARD
CN2401
7P
SCL 1
SDA 2
9V 3
GND 4
HEADPHONES 5
AUDIO/VCC 6
PGND 7
TO-CN402 ABOARD
CN2402
5P
RT 1
LT 2
GND 3
L 4
R 5
19V
9V
SW
SW L
SW R
K BOARD
AUDIO
9-965-959-01<BA6S>K

K BOARD IC VOLTAGE LIST

IC2401		IC2403	
PIN	VOLT	PIN	VOLT
1	8.3	1	4.5
2	GND	2	4.5
3	19.6	3	4.5
4	8.3	4	4.5
5	19.6	5	4.5
6	3.2	6	4.5
7	GND	7	4.5
8	0.0	8	4.5
9	3.2	9	1.0
10	9.1	10	4.5
11	9.7	11	3.4
12	3.2	12	3.3
13	3.3	13	4.5
14	8.3	14	4.5
15	GND	15	GND
16	19.6	16	9.0
17	8.3	17	4.9
IC2402		18	0.0
PIN	VOLT	19	3.88
1	4.5	20	3.88
2	4.5	21	4.5
3	4.5	22	4.5
4	GND	23	4.5
5	4.5	24	4.5
6	4.5	25	4.5
7	4.5	26	4.5
8	9.0	27	4.5

IC2404	
PIN	VOLT
1	n/c
2	4.0
3	4.0
4	4.0
5	4.0
6	GND
7	n/c
8	3.8
9	4.0
10	4.0
11	4.0
12	4.0
13	4.0
14	4.0
15	4.0
16	n/c
17	n/c
18	4.0
19	5.8
20	GND
21	GND
22	4.0
23	2.65
24	4.0

28	4.5	25	4.0
29	4.5	26	4.0
30	4.5	27	4.37
31	n/c	28	4.0
32	n/c	29	4.0
33	n/c	30	n/c
34	4.0	31	n/c
35	9.0	32	n/c
36	4.0	33	n/c
37	4.0	34	4.0
38	1.45	35	GND
39	4.0	36	4.0
40	4.0	37	4.0
41	4.0	38	4.0
42	4.0	39	4.0
43	4.0	40	4.0
44	4.0	41	4.0
45	4.0	42	4.0
46	4.0	43	4.0
47	0.0	44	4.0
48	n/c	45	4.0
49	n/c	46	4.0
50	4.0	47	0.0
51	3.0	48	n/c
52	3.0	49	n/c
53	3.0	50	4.0

IC2405	
PIN	VOLT
1	7.7
2	4.6
3	0.0
4	4.5
5	0.0
6	9.0
7	n/c
8	n/c
9	n/c
10	n/c
11	4.5
12	4.5
13	4.5
14	4.5
15	4.5
16	4.5
17	4.5
18	4.5
19	4.5
20	4.5
21	4.5
22	4.5
23	4.5
24	4.5
25	4.5
26	4.5
27	4.5
28	4.5
29	4.5
30	4.5

All voltages are in V.

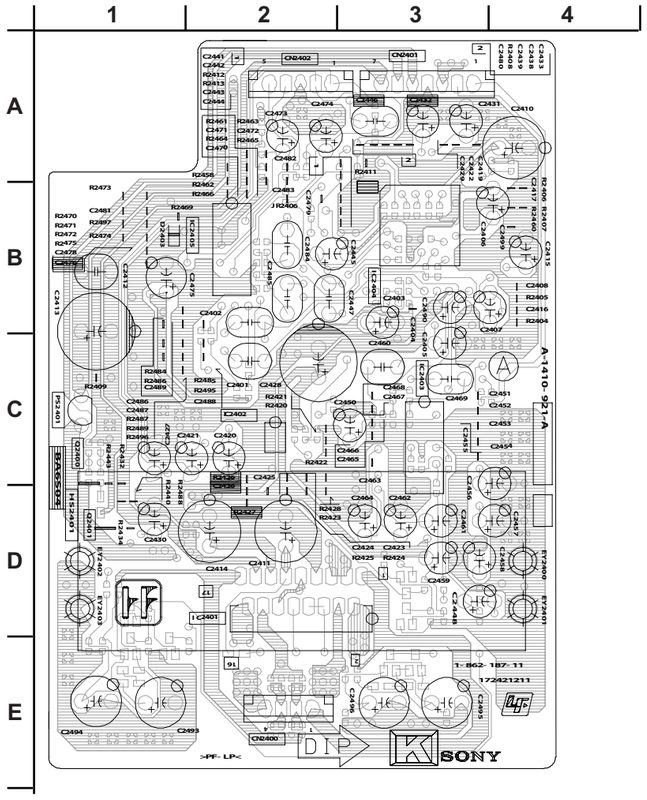
K BOARD TRANSISTOR LIST

	B	C	E
Q2400	0.7	0.0	GND
Q2401	0.0	17.9	0.0
Q2410	4.8	0.0	4.8
Q2411	4.8	0.0	4.8
Q2412	4.8	0.0	4.9
Q2413	4.8	0.0	4.9
Q2414	0.0	0.2	GND
Q2418	0.0	0.7	GND
Q2419	0.0	0.0	GND

All voltages are in V.

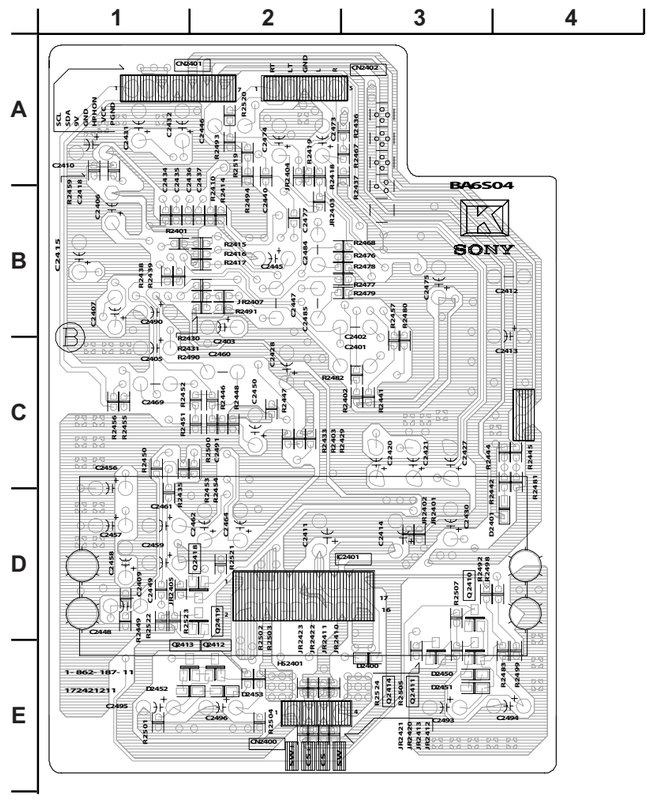
K [AUDIO]

COMPONENT SIDE (KV-21FA310 ONLY)



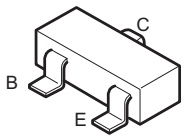
K [AUDIO]

CONDUCTOR SIDE (KV-21FA310 ONLY)

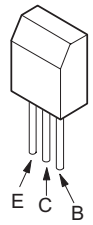


5-4. SEMICONDUCTORS

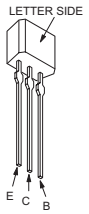
2SB709A-QRS-TX
2SD601A-QRS-TX



2SB734-T-34
2SC3209LK-TP



2SA1309A-QRSTA
2SC3311A-QRSTA
2SD2144S-TP-UVW



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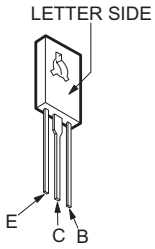
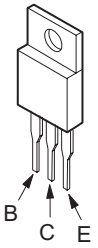
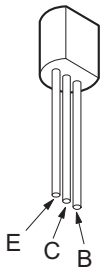


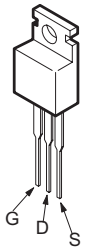
2SA1837



2SA1091O-TPE2



IRF614



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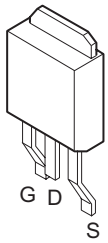
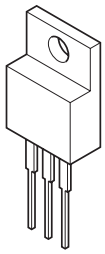
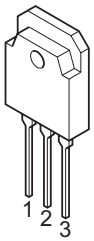


2SC4793



2SD2578-YB



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ERA82-004TP5
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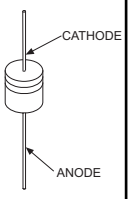
D1NS0R-TA
MTZJ-T-77-12C
MTZJ-T-77-15B
MTZJ-T-77-33B
MTZJ-T-77-39



RU-1P
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EGP20DPKG23
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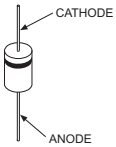
MTZJ-T-77-5.6C
MTZJ-T-77-7.5A
MTZJ-T-77-10B
MTZJ-T-77-30D
RGP10-GPKG3
RGP02-17PKG23
RGP15GPKG23



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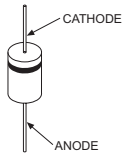
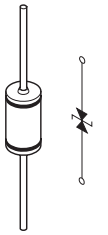
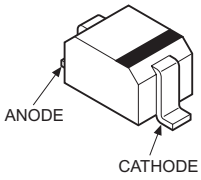


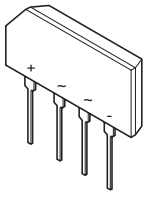
RD9.1EW-T1



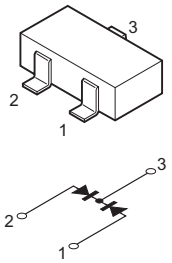
MA111-TX
UDZ-TE-17.5.1B UDZ-TE-17.91B



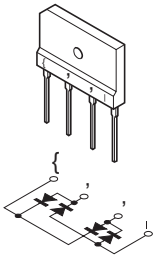
D2SB60A-F04



DAP202K-T-146



D4SB60L-F



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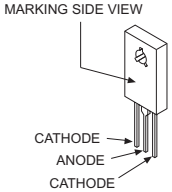
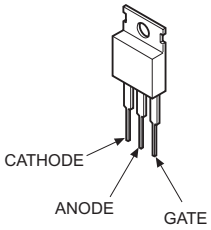


TF541M



SECTION 6: EXPLODED VIEWS

Components not identified by a part number or description are not stocked because they are seldom required for routine service.

The component parts of an assembly are indicated by the reference numbers in the far right column of the parts list and within the dotted lines of the diagram.

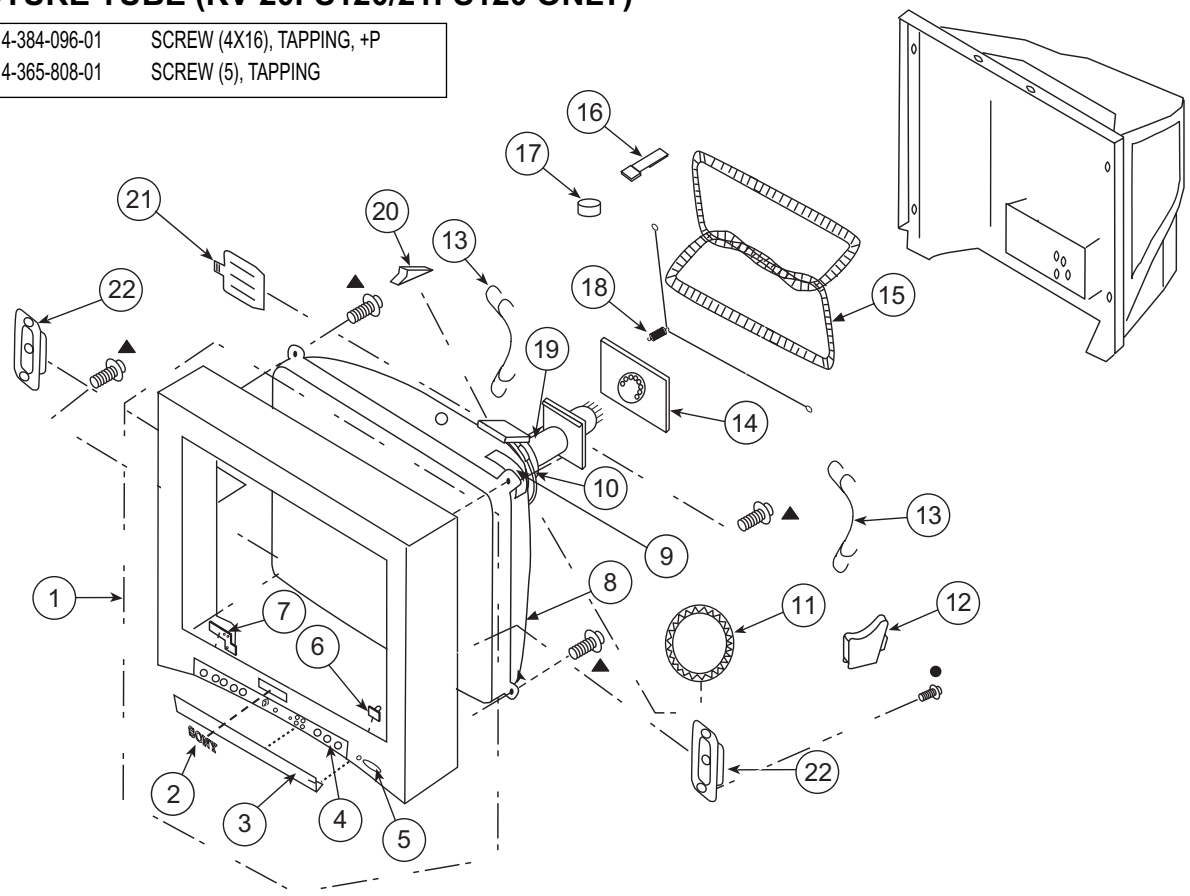
*** Items marked with an asterisk are not stocked since they are seldom required for routine service. Expect some delay when ordering these components.**

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

6-1. PICTURE TUBE (KV-20FS120/21FS120 ONLY)

● 4-384-096-01 SCREW (4X16), TAPPING, +P
▲ 4-365-808-01 SCREW (5), TAPPING



REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
1	X-4042-988-1	BEZNET ASSY (20) (KV-20FS120 ONLY)	[2-7]
1	X-4042-990-1	BEZNET ASSY (21) (KV-21FS120 ONLY)	[2-7]
2	4-046-161-21	EMBLEM, SONY NO.8	
3	4-102-301-11	DOOR	
4	4-102-307-01	LABEL, DOOR	
5	4-102-305-11	BUTTON, POWER	
6	4-102-306-01	GUIDE, LED/IR	
* 7	4-083-303-01	SPRING, METAL	
⚠ 8	8-738-831-05	CRT 21RSN(SDP) (ALL EXCEPT KV-21FS120 L SOUTH)	
⚠ 8	8-738-838-05	CRT 21RSN(SDP)(SOUTH) (KV-21FS120 L SOUTH ONLY)	
* 9	4-074-576-01	CUSHION, DGC	
⚠ 10	8-451-505-71	DY Y21RSA-V	

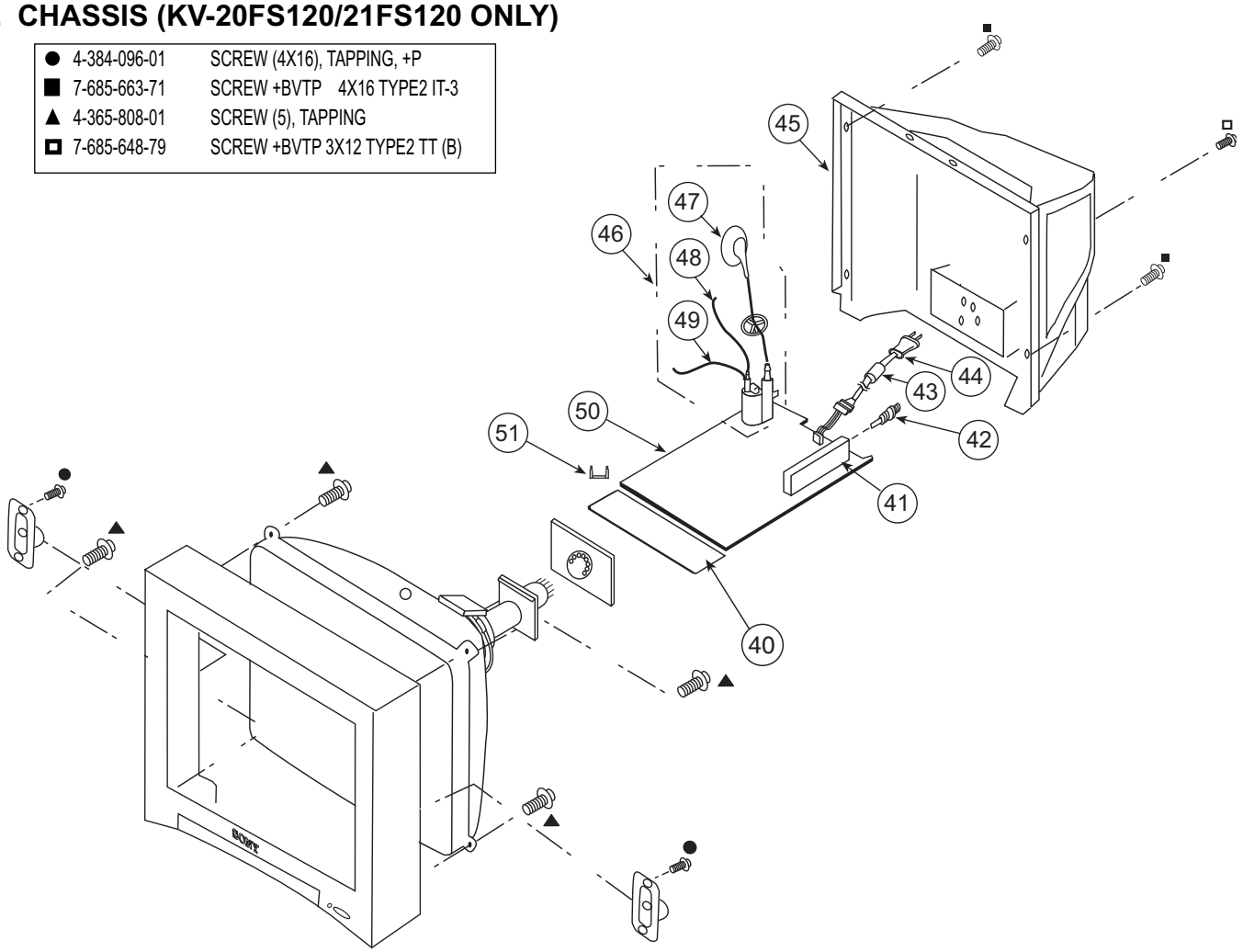
REF. NO.	PART NO.	DESCRIPTION
⚠ 11	1-456-285-11	COIL, NA ROTATION (RT-154)
12	4-102-537-01	SUPPORT, CRT(20)
* 13	4-080-810-21	BAND, DEGAUSS COIL
* 14	A-1410-919-A	CV (VAR) BOARD, MOUNTED
⚠ 15	1-456-153-11	COIL, DEGAUSSING
16	4-083-414-01	PIECE A(110), CONV CORRECT
17	1-452-032-00	MAGNET, DISC
* 18	4-375-394-01	SPRING, TENSION
⚠ 19	1-451-561-21	NECK ASSEMBLY
⚠ 20	4-053-005-01	SPACER, DY
21	4-057-714-01	PIECE ASSY, TLH CORRECTION
22	1-825-831-11	LOUDSPEAKER (15X6.5CM)

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

6-2. CHASSIS (KV-20FS120/21FS120 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
■	7-685-663-71	SCREW +BVTP 4X16 TYPE2 IT-3
▲	4-365-808-01	SCREW (5), TAPPING
◘	7-685-648-79	SCREW +BVTP 3X12 TYPE2 TT (B)



REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
* 40	A-1415-580-A	HB (VAR) BOARD, MOUNTED	
⚠ 41	8-598-593-50	TUNER, FSS BTF-WA421	
⚠ 42	1-766-374-11	PLUG, F-PIN	
43	1-500-586-11	FILTER, CLAMP (FERRITE CORE) (KV-21FS120 L SOUTH ONLY)	
⚠ 44	1-824-069-11	CORD, AC POWER (WITH CONNECTOR) (ALL EXCEPT KV-21FS120 L SOUTH)	
⚠ 44	1-757-840-12	CORD, POWER (WITH CONNECTOR) (KV-21FS120 L SOUTH ONLY)	
45	4-102-302-01	COVER, REAR	
⚠ 46	1-453-316-21	FBT ASSY NX-1748//X4A4	[47-49]
⚠ 47	1-251-642-52	CAP ASSY, HIGH-VOLTAGE	
⚠ 48	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD	
⚠ 49	1-900-803-22	WIRE ASSY, G2 LEAD	

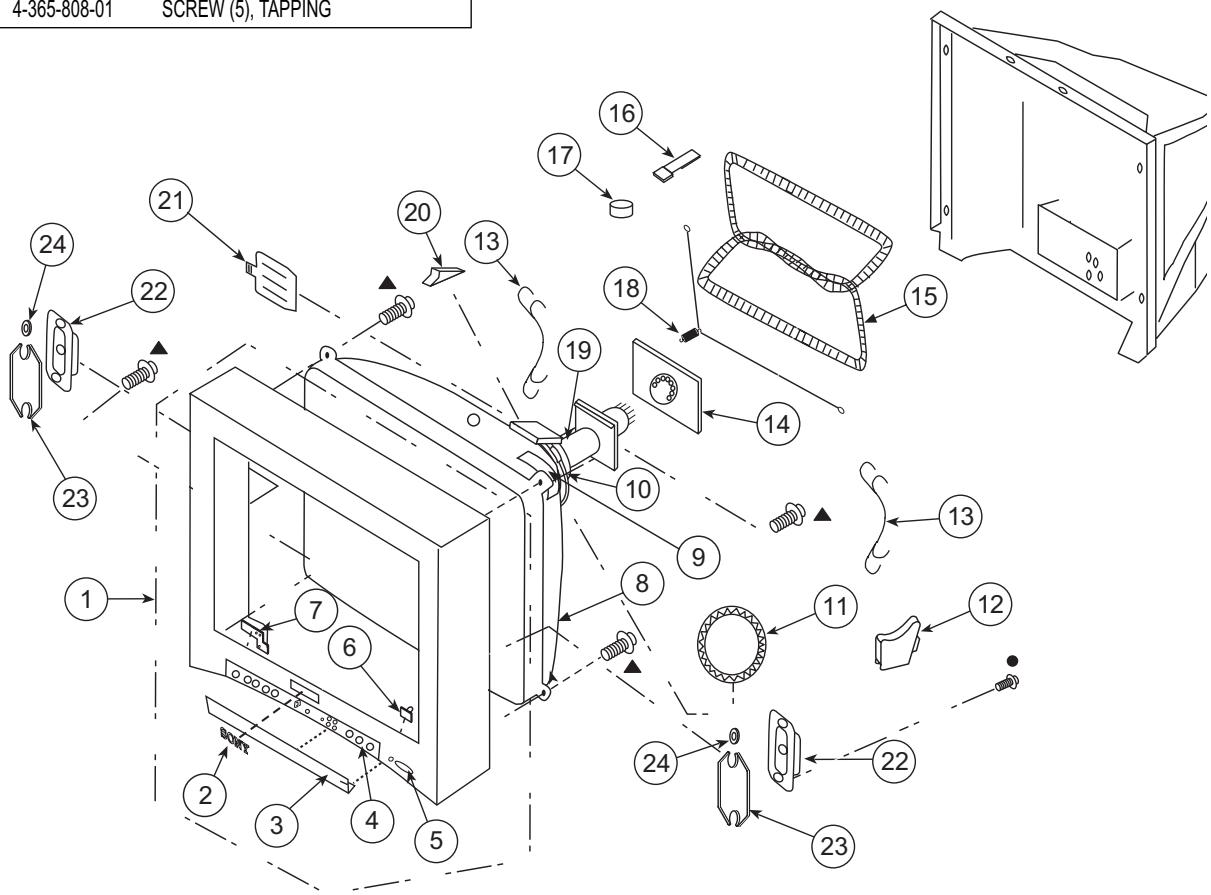
REF. NO.	PART NO.	DESCRIPTION
* 50	A-1302-931-A	A BOARD, COMPLETE (KV-20FS120/21FS120 L NORTH ONLY)
		The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 47-49)
* 50	A-1302-980-A	A BOARD, COMPLETE (KV-21FS120 L SOUTH ONLY)
		The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 47-49)
* 51	4-076-951-01	HINGE, PWB

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

6-3. PICTURE TUBE (KV-21FM120 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
▲	4-365-808-01	SCREW (5), TAPPING



	REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
*	1	X-4042-989-1	BEZNET ASSY (21)	[2-7]
	2	4-046-161-21	EMBLEM, SONY NO.8	
	3	4-102-301-11	DOOR	
	4	4-102-307-11	LABEL, DOOR	
	5	4-102-305-11	BUTTON, POWER	
	6	4-102-306-01	GUIDE, LED/IR	
*	7	4-083-303-01	SPRING, METAL	
⚠	8	8-738-831-05	CRT 21RSN(SDP)	
*	9	4-074-576-01	CUSHION, DGC	
⚠	10	8-451-505-71	DY Y21RSA-V	
⚠	11	1-456-285-11	COIL, NA ROTATION (RT-154)	
	12	4-102-537-01	SUPPORT, CRT(20)	
*	13	4-080-810-21	BAND, DEGAUSS COIL	
*	14	A-1410-919-A	CV (VAR) BOARD, MOUNTED	
⚠	15	1-456-153-11	COIL, DEGAUSSING	

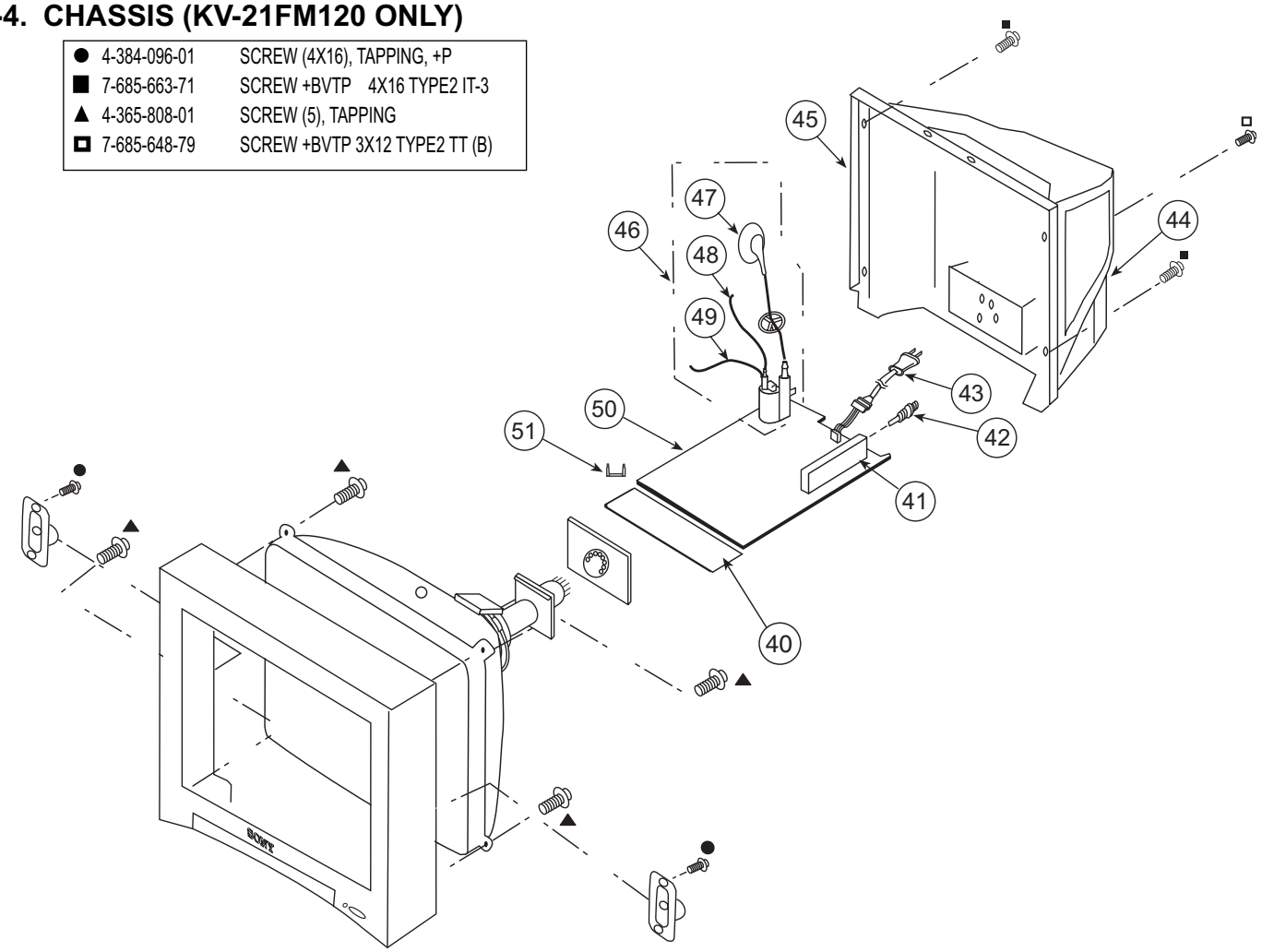
	REF. NO.	PART NO.	DESCRIPTION
	16	4-083-414-01	PIECE A(110), CONV CORRECT
	17	1-452-032-00	MAGNET, DISC
*	18	4-375-394-01	SPRING, TENSION
⚠	19	1-451-561-21	NECK ASSEMBLY
⚠	20	4-053-005-01	SPACER, DY
	21	4-057-714-01	PIECE ASSY, TLH CORRECTION
	22	1-825-039-11	SPEAKER (15X6.5CM)
*	23	4-046-981-03	BRACKET, SPEAKER
*	24	4-374-745-91	CUSHION (A)

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

6-4. CHASSIS (KV-21FM120 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
■	7-685-663-71	SCREW +BVTP 4X16 TYPE2 IT-3
▲	4-365-808-01	SCREW (5), TAPPING
□	7-685-648-79	SCREW +BVTP 3X12 TYPE2 TT (B)



	REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
*	40	A-1415-692-A	HB (VAR) BOARD, MOUNTED	
⚠	41	8-598-594-30	TUNER, FSS BTF-FA421	
⚠	42	1-766-374-11	PLUG, F-PIN	
⚠	43	1-824-069-11	CORD, AC POWER (WITH CONNECTOR)	
*	44	4-102-308-01	LABEL, TERMINAL	
	45	4-102-302-01	COVER, REAR	
⚠	46	1-453-316-21	FBT ASSY NX-1748//X4A4	[47-49]
⚠	47	1-251-642-52	CAP ASSY, HIGH-VOLTAGE	
⚠	48	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD	

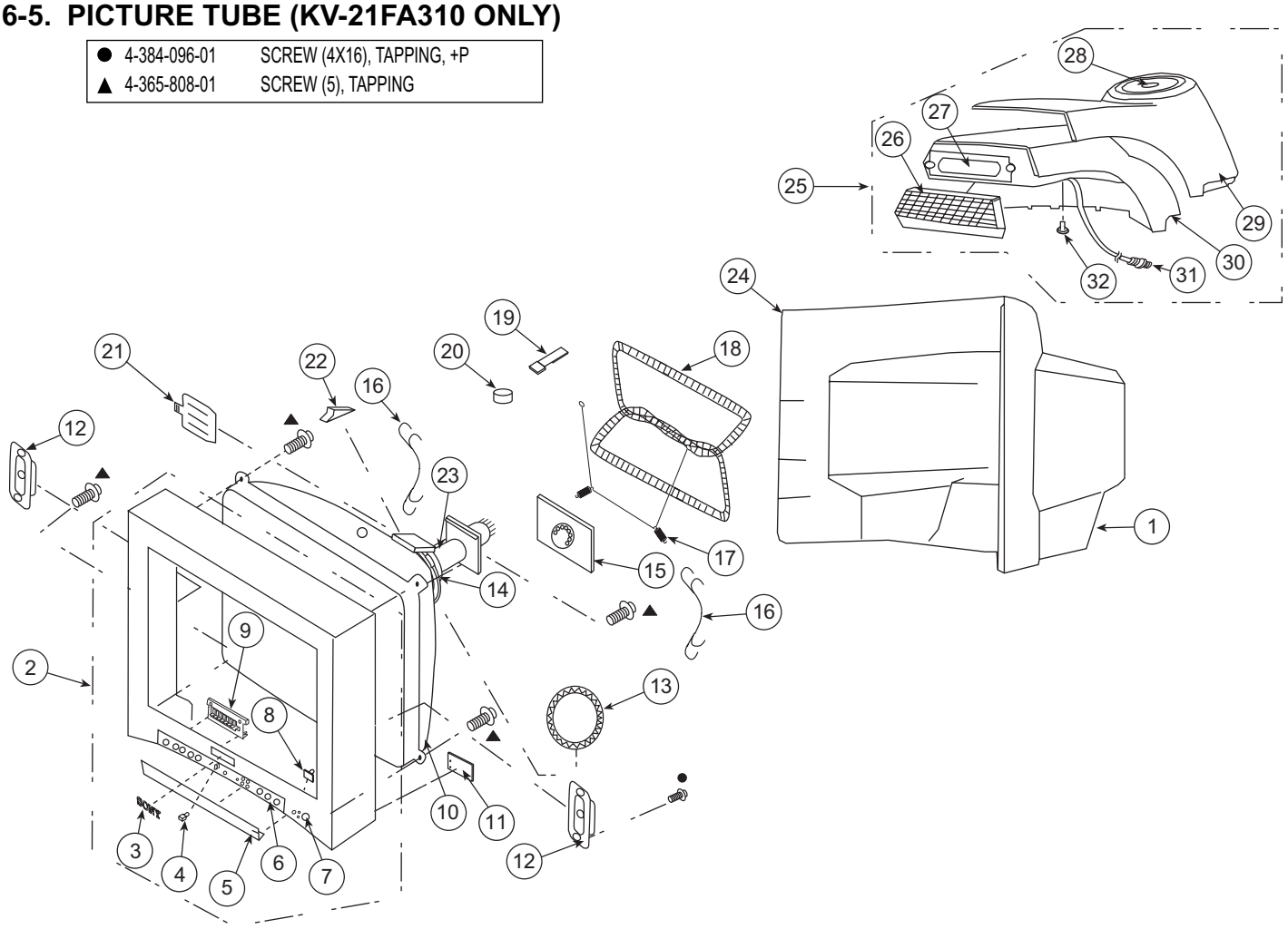
	REF. NO.	PART NO.	DESCRIPTION
⚠	49	1-900-803-22	WIRE ASSY, G2 LEAD
*	50	A-1302-979-A	A BOARD, COMPLETE
			The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 47-49)
*	51	4-076-951-01	HINGE, PWB

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

6-5. PICTURE TUBE (KV-21FA310 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
▲	4-365-808-01	SCREW (5), TAPPING



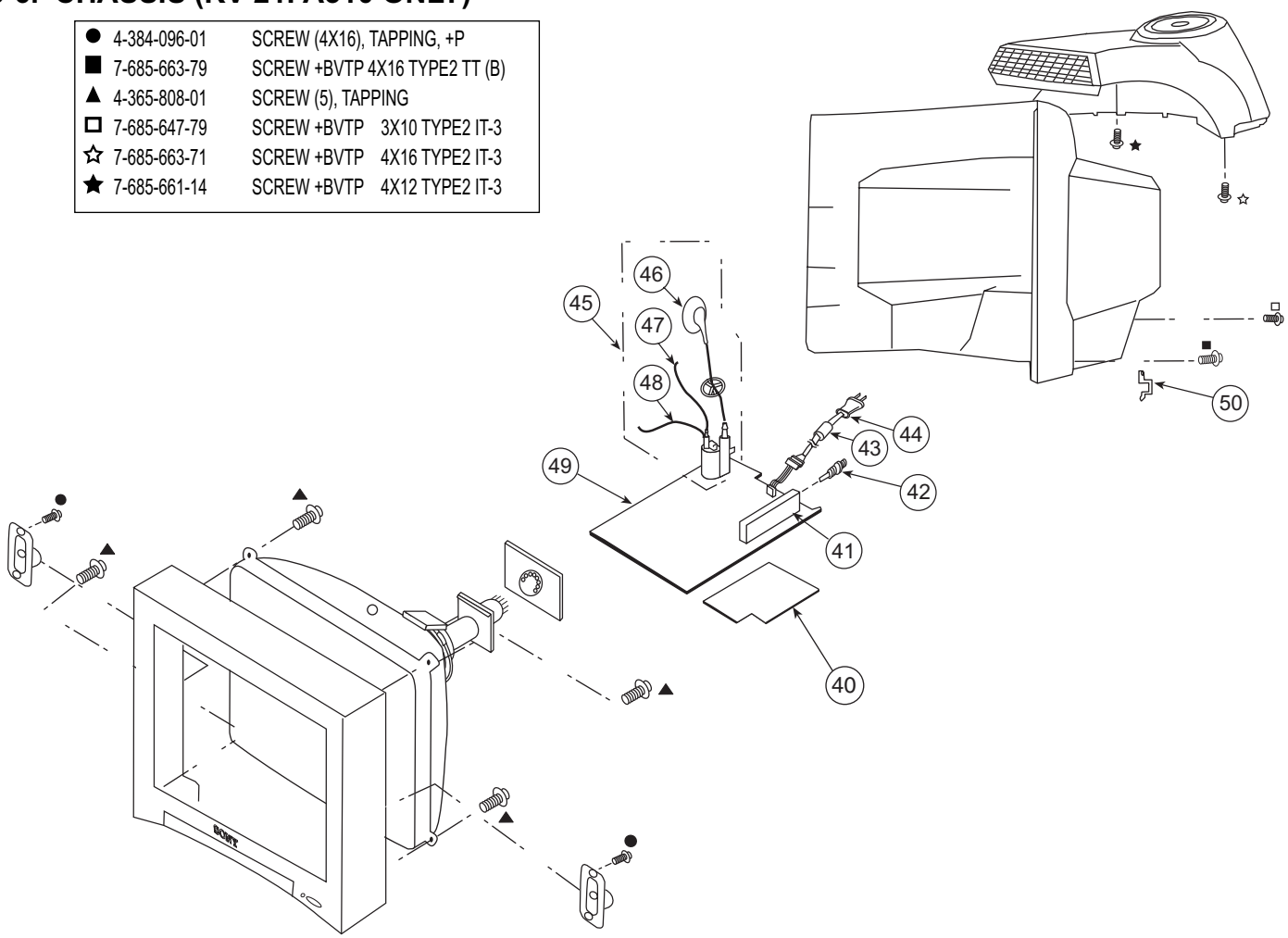
REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
* 1	4-094-381-11	LABEL, 21FA TERMINAL	
2	X-4043-168-1	BEZNET ASSY	[3-9]
3	4-046-161-21	EMBLEM, SONY NO.8	
4	4-042-192-01	CATCHER, PUSH	
5	4-087-155-11	DOOR, CONTROL	
6	4-074-895-71	LABEL, FRONT TERMINAL (20)	
7	4-087-150-41	BUTTON, POWER	
8	4-087-156-01	GUIDE, LIGHT	
9	4-087-151-01	BUTTON, MULTI	
⚠ 10	8-738-831-05	CRT 21RSN(SDP) (KV-21FA310 L NORTH ONLY)	
⚠ 10	8-738-838-05	CRT 21RSN(SDP)(SOUTH) (KV-21FA310 L SOUTH ONLY)	
* 11	A-1415-629-A	HR (VAR) BOARD, MOUNTED	
12	1-825-808-11	LOUDSPEAKER (19.2CMX4.2CM)	
⚠ 13	1-456-285-11	COIL, NA ROTATION (RT-154)	
⚠ 14	8-451-505-71	DY Y21RSA-V	
* 15	A-1410-919-A	CV (VAR) BOARD, MOUNTED	
* 16	4-080-810-21	BAND, DEGAUSS COIL	
* 17	4-375-394-01	SPRING, TENSION	
⚠ 18	1-456-153-11	COIL, DEGAUSSING	
19	4-083-414-01	PIECE A(110), CONV CORRECT	
20	1-452-032-00	MAGNET, DISC	
21	4-057-714-01	PIECE ASSY, TLH CORRECTION	
⚠ 22	4-053-005-01	SPACER, DY	
⚠ 23	1-451-561-21	NECK ASSEMBLY	
24	4-087-153-04	COVER, REAR	
* 25	A-1606-602-A	SPEAKER ASSY (21)	[26-32]
* 26	4-101-825-01	GRILLE, CENTER (W21)	
27	1-825-809-11	LOUDSPEAKER (19.2CMX4.2CM)	
28	1-825-807-11	LOUDSPEAKER (13CM)	
* 29	4-101-822-01	COVER, TOP (W21)	
* 30	4-101-823-01	COVER, BOTTOM (W21)	
* 31	1-828-903-11	CONNECTION CABLE	
* 32	4-068-528-41	FOOT	

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

6-6. CHASSIS (KV-21FA310 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
■	7-685-663-79	SCREW +BVTP 4X16 TYPE2 TT (B)
▲	4-365-808-01	SCREW (5), TAPPING
□	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3
☆	7-685-663-71	SCREW +BVTP 4X16 TYPE2 IT-3
★	7-685-661-14	SCREW +BVTP 4X12 TYPE2 IT-3



	REF. NO.	PART NO.	DESCRIPTION [ASSEMBLY INCLUDES]
*	40	A-1410-921-A	K BOARD, MOUNTED
⚠	41	8-598-593-50	TUNER, FSS BTF-WA421
⚠	42	1-766-374-11	PLUG, F-PIN
	43	1-500-586-11	FILTER, CLAMP (FERRITE CORE) (KV-21FA310 L SOUTH ONLY)
⚠	44	1-824-069-11	CORD, AC POWER (WITH CONNECTOR) (KV-21FA310 L NORTH ONLY)
⚠	44	1-757-840-12	CORD, POWER (WITH CONNECTOR) (KV-21FA310 L SOUTH ONLY)
⚠	45	1-453-316-21	FBT ASSY NX-1748//X4A4 [46-48]
⚠	46	1-251-642-52	CAP ASSY, HIGH-VOLTAGE
⚠	47	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD
⚠	48	1-900-803-22	WIRE ASSY, G2 LEAD

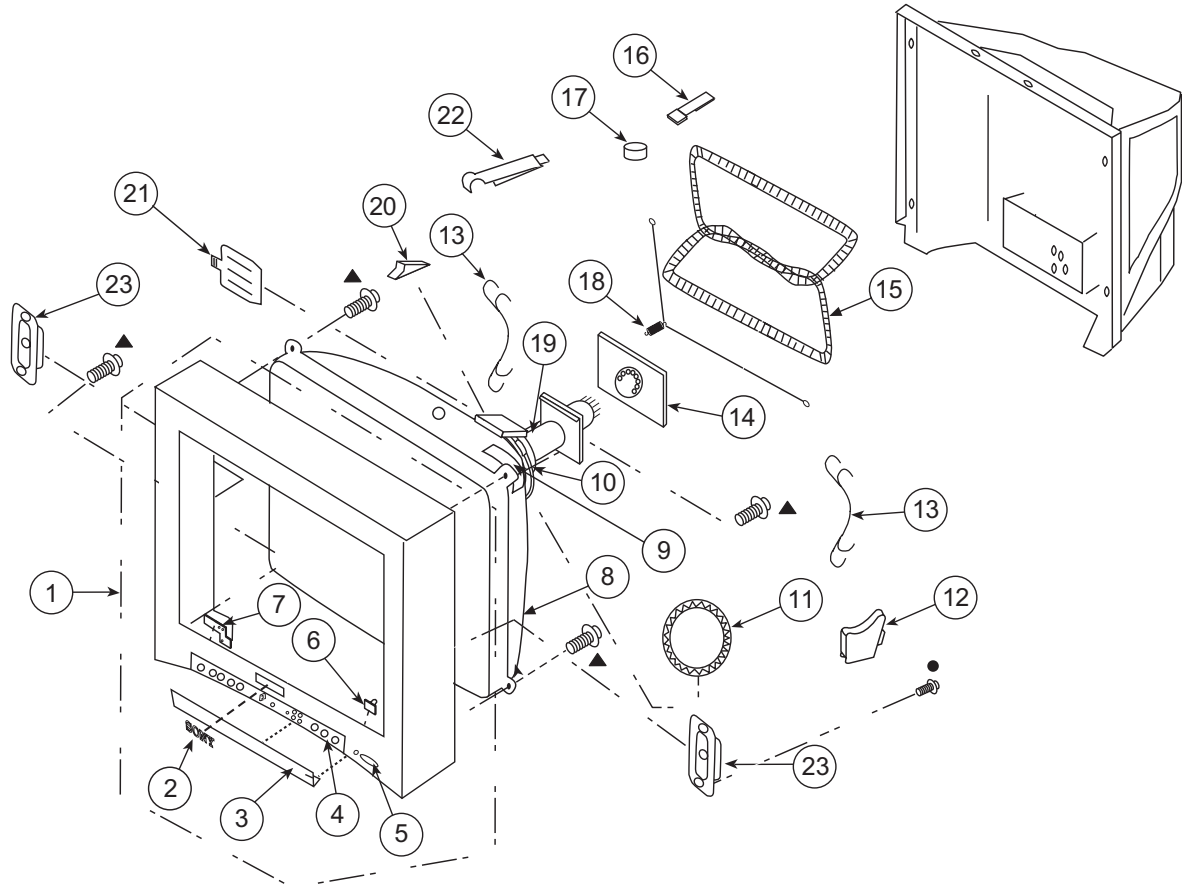
	REF. NO.	PART NO.	DESCRIPTION
*	49	A-1302-879-A	A BOARD, COMPLETE (KV-21FA310 L NORTH ONLY)
			The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 46-48)
*	49	A-1302-953-A	A BOARD, COMPLETE (KV-21FA310 L SOUTH ONLY)
			The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 46-48)
*	50	4-081-980-11	HOLDER, AC CABLE

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

6-7. PICTURE TUBE (KV-24FS120/25FS120 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
▲	4-046-765-12	SCREW, TAPPING 7+CROWN WASHER



REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
1	X-4042-991-1	BEZNET ASSY	[2-7]
2	4-046-160-31	EMBLEM, SONY NO.9	
3	4-102-301-11	DOOR	
4	4-102-307-01	LABEL, DOOR	
5	4-102-305-11	BUTTON, POWER	
6	4-102-306-01	GUIDE, LED/IR	
* 7	4-083-303-01	SPRING, METAL	
⚠ 8	8-733-250-05	CRT 25RSN	
9	4-089-346-01	CUSHION, DGC	
⚠ 10	1-451-475-11	DEFLECTION YOKE (Y25RSA)	
⚠ 11	1-452-896-11	COIL, NA ROTATION (RT-200)	
12	4-102-536-01	SUPPORT, CRT(24)	
* 13	4-080-810-21	BAND, DEGAUSS COIL	
* 14	A-1415-605-A	CV (VAR) BOARD, MOUNTED	

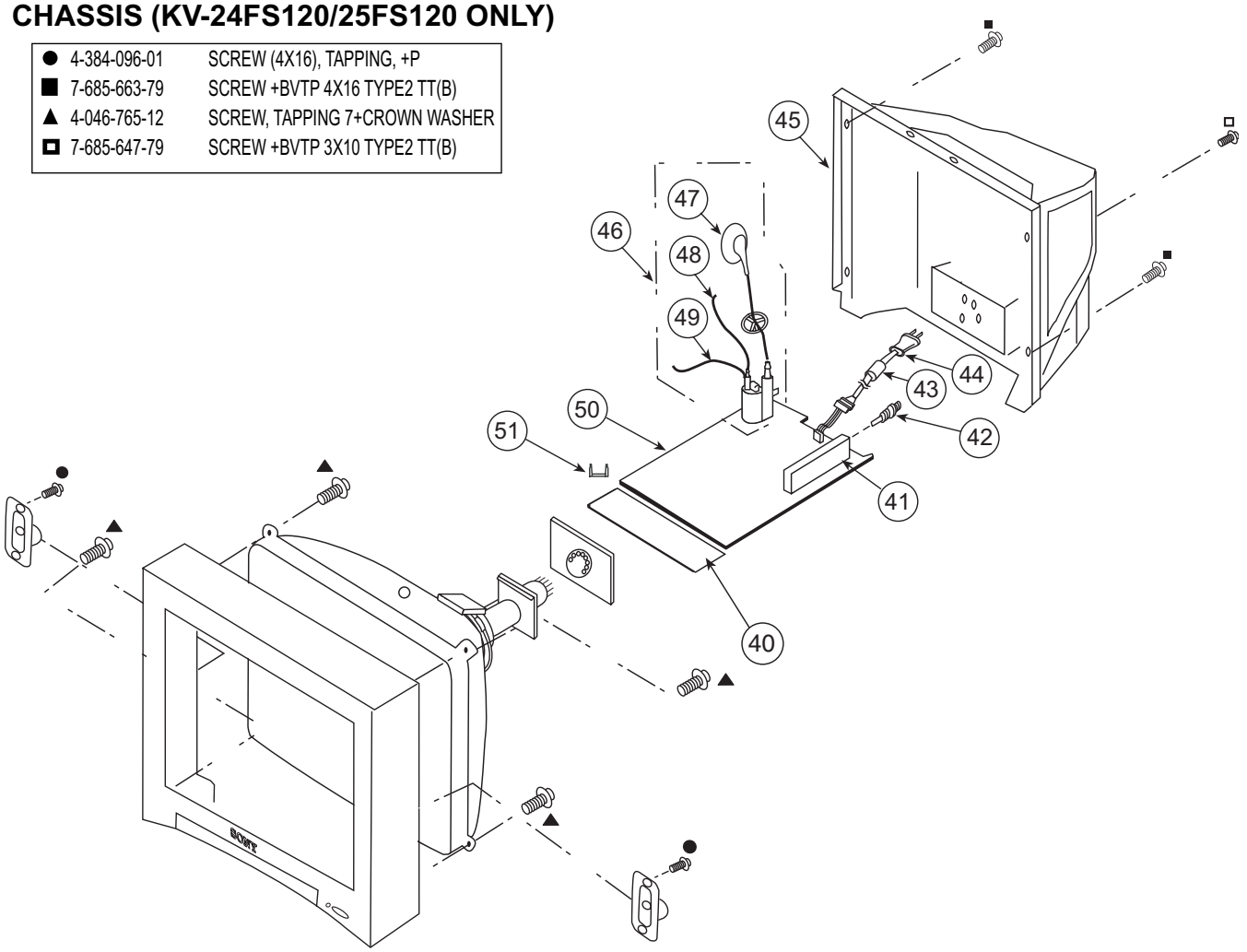
REF. NO.	PART NO.	DESCRIPTION
⚠ 15	1-419-509-21	COIL, DEGAUSSING (ALL EXCEPT KV-25FS120 L. SOUTH)
⚠ 15	1-456-576-11	DEGAUSSING COIL (KV-25FS120 L. SOUTH ONLY)
16	4-083-414-01	PIECE A(110), CONV CORRECT
17	1-452-032-00	MAGNET,DISC
18	4-036-329-01	SPRING (B), TENSION
⚠ 19	1-451-561-21	NECK ASSEMBLY
⚠ 20	4-053-005-01	SPACER, DY
21	4-057-714-01	PIECE ASSY, TLH CORRECTION
22	4-102-312-01	CLIP, DGC
23	1-825-831-11	LOUDSPEAKER (15X6.5CM)

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

6-8. CHASSIS (KV-24FS120/25FS120 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
■	7-685-663-79	SCREW +BVTP 4X16 TYPE2 TT(B)
▲	4-046-765-12	SCREW, TAPPING 7+CROWN WASHER
◘	7-685-647-79	SCREW +BVTP 3X10 TYPE2 TT(B)



REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
* 40	A-1415-580-A	HB (VAR) BOARD, MOUNTED	
⚠ 41	8-598-593-50	TUNER, FSS BTF-WA421	
⚠ 42	1-766-374-11	PLUG, F-PIN	
43	1-500-586-11	FILTER, CLAMP (FERRITE CORE) (KV-25FS120 L. SOUTH ONLY)	
⚠ 44	1-824-069-11	CORD, AC POWER(WITH CONNECTOR) (ALL EXCEPT KV-25FS120 L. SOUTH)	
⚠ 44	1-757-840-12	CORD, POWER (WITH CONNECTOR) (KV-25FS120 L. SOUTH ONLY)	
45	4-102-310-01	COVER, REAR	
⚠ 46	1-453-336-11	FBT ASSY NX-4011//X4A4	[47-49]
⚠ 47	1-251-642-52	CAP ASSY, HIGH-VOLTAGE	
⚠ 48	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD	
⚠ 49	1-900-803-22	WIRE ASSY, G2 LEAD	

REF. NO.	PART NO.	DESCRIPTION
* 50	A-1302-944-A	A BOARD, COMPLETE (ALL EXCEPT KV-25FS120 L. SOUTH)
		The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 47-49)
* 50	A-1303-007-A	A BOARD, COMPLETE (KV-25FS120 L. SOUTH ONLY)
		The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 47-49)
* 51	4-076-951-01	HINGE, PWB

SECTION 7: ELECTRICAL PARTS LIST

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

The components in this manual identified by the following symbol: ⋈ indicate parts that have been carefully factory-selected to satisfy regulations regarding X-ray radiation for each set.

Should replacement be required for one of these components, replace only with the value originally used.

*** Items marked with an asterisk are not stocked since they are seldom required for routine service. Expect some delay when ordering these components.**

RESISTORS
- **All resistors are in ohms**
- **F : nonflammable**
- **All variable and adjustable resistors have characteristic curve B, unless otherwise noted.**

When ordering parts by reference number, please include the board name.

A

REF. NO.	PART NO.	DESCRIPTION	VALUES
*	**A-1302-879-A**	**A BOARD, COMPLETE (KV-21FA310 LATIN NORTH ONLY)**	
*	**A-1302-931-A**	**A BOARD, COMPLETE (KV-20FS120/21FS120 LATIN NORTH ONLY)**	
*	**A-1302-944-A**	**A BOARD, COMPLETE (KV-24FS120/25FS120 LATIN NORTH ONLY)**	
*	**A-1302-953-A**	**A BOARD, COMPLETE (KV-21FA310 LATIN SOUTH ONLY)**	
*	**A-1302-979-A**	**A BOARD, COMPLETE (KV-21FM120 ONLY)**	
*	**A-1302-980-A**	**A BOARD, COMPLETE (KV-21FS120 LATIN SOUTH ONLY)**	
*	**A-1303-007-A**	**A BOARD, COMPLETE (KV-25FS120 LATIN SOUTH ONLY)**	
⚠	1-533-223-11	FUSE HOLDER	0A 0V
*	4-374-846-11	COVER, CAPACITOR, CAP TYPE	
	4-382-854-11	SCREW (M3X10), P, SW (+)	

The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. Order the following leads when requesting this A Board:

⚠	1-251-642-52	CAP ASSY, HIGH-VOLTAGE	
⚠	1-900-803-22	WIRE ASSY, G2 LEAD	
⚠	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD	

CAPACITOR

C003	1-162-919-11	CERAMIC CHIP	22pF	5%	50V
C004	1-162-923-11	CERAMIC CHIP	47pF	5%	50V
C005	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
C006	1-126-942-61	ELECT	1000µF	20%	25V
C007	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
C008	1-126-956-91	ELECT	0.1µF	20%	50V
C009	1-164-230-11	CERAMIC CHIP	220pF	5%	50V
C010	1-126-960-11	ELECT	1µF	20%	50V
C011	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
C012	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C014	1-126-960-11	ELECT	1µF	20%	50V
C015	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C019	1-126-956-91	ELECT	0.1µF	20%	50V
C021	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C022	1-126-964-11	ELECT	10µF	20%	50V
C023	1-126-935-11	ELECT	470µF	20%	16V
C033	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C041	1-126-964-11	ELECT	10µF	20%	50V
C047	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
C048	1-104-665-11	ELECT	100µF	20%	25V
C049	1-126-960-11	ELECT	1µF	20%	50V
C051	1-126-964-11	ELECT	10µF	20%	50V
C052	1-164-230-11	CERAMIC CHIP	220pF	5%	50V
C053	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C054	1-126-960-11	ELECT	1µF	20%	50V
C056	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
C057	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C064	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C074	1-126-964-11	ELECT	10µF	20%	50V
C075	1-126-935-11	ELECT	470µF	20%	16V
C076	1-104-665-11	ELECT	100µF	20%	25V
C077	1-126-947-11	ELECT	47µF	20%	35V
C079	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C080	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
C081	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
C090	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C091	1-126-947-11	ELECT	47µF	20%	35V
C092	1-126-947-11	ELECT	47µF	20%	35V
C094	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C095	1-126-947-11	ELECT	47µF	20%	35V
C096	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C097	1-126-947-11	ELECT	47µF	20%	35V
C098	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C099	1-126-947-11	ELECT	47µF	20%	35V
C100	1-126-956-91	ELECT	0.1µF	20%	50V

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
C115	1-164-739-11	CERAMIC CHIP	560pF	5%	50V
C116	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C200	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C202	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C203	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C204	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
	(KV-21FA310LN/21FA310LS ONLY)				
C204	1-216-864-11	CHIP, CONDUCTOR	0		
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C205	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
	(KV-21FA310LN/21FA310LS ONLY)				
C205	1-216-864-11	CHIP, CONDUCTOR	0		
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C212	1-126-963-11	ELECT	4.7µF	20%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C213	1-126-963-11	ELECT	4.7µF	20%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C220	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C301	1-126-956-91	ELECT	0.1µF	20%	50V
C302	1-126-956-91	ELECT	0.1µF	20%	50V
C303	1-126-956-91	ELECT	0.1µF	20%	50V
C304	1-126-956-91	ELECT	0.1µF	20%	50V
C305	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C306	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C307	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C309	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C313	1-126-956-91	ELECT	0.1µF	20%	50V
C318	1-126-964-11	ELECT	10µF	20%	50V
C319	1-126-964-11	ELECT	10µF	20%	50V
C325	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
C326	1-164-505-11	CERAMIC CHIP	2.2µF	16V	
C328	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C330	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C337	1-162-919-11	CERAMIC CHIP	22pF	5%	50V
C351	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
C370	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C390	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C400	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
	(KV-21FA310LN/21FA310LS ONLY)				
C401	1-164-227-11	CERAMIC CHIP	0.022µF	10%	25V
C402	1-164-174-11	CERAMIC CHIP	0.0082µF	10%	25V
	(KV-21FA310LN/21FA310LS ONLY)				
C403	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C404	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C405	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V
	(KV-21FA310LN/21FA310LS ONLY)				
C406	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V
	(KV-21FA310LN/21FA310LS ONLY)				
C407	1-162-965-11	CERAMIC CHIP	0.0015µF	10%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C407	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C408	1-162-965-11	CERAMIC CHIP	0.0015µF	10%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C408	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C409	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
	(KV-21FA310LN/21FA310LS ONLY)				
C409	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C410	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
	(KV-21FA310LN/21FA310LS ONLY)				
C410	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C411	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
	(KV-21FA310LN/21FA310LS ONLY)				
C412	1-126-960-11	ELECT	1µF	20%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C412	1-124-252-00	ELECT	0.33µF	20%	50V
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C413	1-126-963-11	ELECT	4.7µF	20%	50V
C414	1-126-961-11	ELECT	2.2µF	20%	50V
C415	1-126-963-11	ELECT	4.7µF	20%	50V
C416	1-126-960-11	ELECT	1µF	20%	50V
C417	1-126-960-11	ELECT	1µF	20%	50V
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C418	1-126-963-11	ELECT	4.7µF	20%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C419	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C420	1-126-960-11	ELECT	1µF	20%	50V
C421	1-126-965-91	ELECT	22µF	20%	50V
C422	1-126-960-11	ELECT	1µF	20%	50V
C423	1-126-963-11	ELECT	4.7µF	20%	50V
C424	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C430	1-126-963-11	ELECT	4.7µF	20%	50V
	(ALL EXCEPT KV-21FM120)				

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	REF. NO.	PART NO.	DESCRIPTION	VALUES		
	C431	1-126-963-11	ELECT	4.7µF	20%	50V
		(ALL EXCEPT KV-21FM120)				
	C436	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
	C440	1-126-965-91	ELECT	22µF	20%	50V
		(KV-21FA310LN/21FA310LS ONLY)				
	C441	1-126-965-91	ELECT	22µF	20%	50V
		(KV-21FA310LN/21FA310LS ONLY)				
	C450	1-126-943-11	ELECT	2200µF	20%	25V
	C451	1-126-959-11	ELECT	0.47µF	20%	50V
	C452	1-126-960-11	ELECT	1µF	20%	50V
	C457	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
		(KV-21FA310LN/21FA310LS ONLY)				
	C457	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
		(ALL EXCEPT 21FA310LN/21FA310LS)				
	C458	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
		(KV-21FA310LN/21FA310LS ONLY)				
	C458	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
		(ALL EXCEPT 21FA310LN/21FA310LS)				
	C460	1-126-943-11	ELECT	2200µF	20%	25V
	C461	1-126-943-11	ELECT	2200µF	20%	25V
	C462	1-126-943-11	ELECT	2200µF	20%	25V
	C463	1-126-943-11	ELECT	2200µF	20%	25V
	C470	1-126-935-11	ELECT	470µF	20%	16V
		(KV-21FA310LN/21FA310LS ONLY)				
	C501	1-126-959-11	ELECT	0.47µF	20%	50V
	C502	1-102-112-00	CERAMIC	330pF	10%	50V
	C503	1-106-383-00	MYLAR	0.047µF	10%	200V
	C504	1-102-228-00	CERAMIC	470pF	10%	500V
	C505	1-102-228-00	CERAMIC	470pF	10%	500V
⚠	C506	1-117-214-11	CERAMIC	0.001µF	10%	2KV
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
⚠	C506	1-162-116-00	CERAMIC	680pF	10%	2KV
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
⚠	C507	1-117-642-11	FILM	8200pF	3%	1.2KV
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
⚠	C507	1-127-717-21	FILM	19000pF	3%	1.2KV
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
⚠	C508	1-129-722-00	FILM	0.047µF	5%	630V
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
⚠	C508	1-130-895-00	FILM	0.056µF	5%	400V
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				

REF. NO.	PART NO.	DESCRIPTION	VALUES		
C509	1-126-964-11	ELECT	10µF	20%	50V
C510	1-117-214-11	CERAMIC	0.001µF	10%	2KV
C511	1-115-521-11	FILM	0.82µF	5%	250V
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
C511	1-117-813-11	FILM	0.75µF	5%	250V
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
C512	1-104-987-11	MYLAR	0.001µF	5%	200V
C513	1-106-383-00	MYLAR	0.047µF	10%	200V
C514	1-115-519-11	FILM	0.82µF	5%	250V
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
C514	1-115-521-11	FILM	0.56µF	5%	250V
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
C515	1-107-651-11	ELECT	4.7µF	20%	250V
C516	1-117-661-11	ELECT	0.15µF	5%	250V
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
C519	1-216-864-11	SHORT CHIP			
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
C519	1-216-828-11	METAL CHIP	3.9K	5%	1/10W
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
C520	1-126-965-91	ELECT	22µF	20%	50V
C521	1-126-960-11	ELECT	1µF	20%	50V
C522	1-102-244-00	CERAMIC	220pF	10%	500V
C523	1-165-529-11	MYLAR	0.22µF	10	275V
C525	1-164-646-11	CERAMIC	2200pF	10%	500V
C526	1-102-244-00	CERAMIC	220pF	10%	500V
C527	1-107-645-11	ELECT	22µF	20%	200V
C529	1-164-690-91	CERAMIC CHIP	0.0022µF	5%	50V
C534	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
C534	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
C535	1-137-372-11	MYLAR	0.022µF	5%	50V
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
C536	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
C536	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
C537	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
C539	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C542	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
C544	1-126-967-11	ELECT	47µF	20%	50V
C545	1-126-969-11	ELECT	220µF	20%	50V
C546	1-137-194-81	FILM	0.47µF	5%	50V

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	REF. NO.	PART NO.	DESCRIPTION	VALUES		
	C549	1-101-821-00	CERAMIC	0.0022µF		500V
	C550	1-104-666-11	ELECT	220µF	20%	25V
	C551	1-126-960-11	ELECT	1µF	20%	50V
	C552	1-126-964-11	ELECT	10µF	20%	50V
	C553	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
	C554	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
	C555	1-101-821-00	CERAMIC	0.0022µF		500V
	C558	1-162-318-11	CERAMIC	0.001µF	10%	500V
	C559	1-216-864-11	SHORT CHIP			
	C560	1-216-833-11	METAL CHIP	10K	5%	1/10W
	C561	1-126-963-11	ELECT	4.7µF	20%	50V
	C562	1-104-666-11	ELECT	220µF	20%	25V
	C563	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
	C566	1-107-635-11	ELECT	4.7µF	20%	160V
	C570	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
	C571	1-104-665-11	ELECT	100µF	20%	25V
	C581	1-136-161-00	FILM	0.047µF	5%	50V
	C582	1-106-387-00	MYLAR	0.068µF	10%	200V
	C585	1-104-666-11	ELECT	220µF	20%	25V
⚠	C588	1-137-417-11	MYLAR	0.015µF	10%	100V
	C589	1-128-560-11	ELECT	22µF	20%	100V
	C590	1-126-964-11	ELECT	10µF	20%	50V
	C594	1-123-024-21	ELECT	33µF		160V
	C595	1-104-666-11	ELECT	220µF	20%	25V
	C597	1-104-666-11	ELECT	220µF	20%	25V
	C600	1-126-964-11	ELECT	10µF	20%	50V
	C601	1-117-703-11	CERAMIC	0.0047µF		250V
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				
⚠	C602	1-165-529-11	MYLAR	0.22µF	10	275V
⚠	C603	1-165-529-11	MYLAR	0.22µF	10	275V
⚠	C605	1-117-699-11	CERAMIC	0.001µF	99%	250V
	C609	1-126-942-61	ELECT	1000µF	20%	25V
	C610	1-164-645-11	CERAMIC	1000pF	10%	500V
	C611	1-126-971-11	ELECT	470µF	20%	50V
	C612	1-126-961-11	ELECT	2.2µF	20%	50V
	C613	1-161-964-91	CERAMIC	0.0047µF		250V
	C615	1-161-964-91	CERAMIC	0.0047µF		250V
	C616	1-126-943-11	ELECT	2200µF	20%	25V
	C617	1-107-935-11	ELECT	330µF	20%	100V
	C618	1-107-935-11	ELECT	330µF	20%	100V
	C620	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
	C621	1-117-893-11	ELECT	470µF	20%	250V
		(ALL EXCEPT KV-21FM120)				

	REF. NO.	PART NO.	DESCRIPTION	VALUES		
	C621	1-165-921-11	ELECT	390µF	20%	250V
		(KV-21FM120 ONLY)				
	C624	1-107-636-11	ELECT	10µF	20%	160V
	C625	1-126-964-11	ELECT	10µF	20%	50V
	C629	1-117-893-11	ELECT	470µF	20%	250V
		(ALL EXCEPT KV-21FM120)				
	C629	1-165-921-11	ELECT	390µF	20%	250V
		(KV-21FM120 ONLY)				
⚠	C631	1-113-896-11	CERAMIC	220pF	10%	250V
	C632	1-126-967-11	ELECT	47µF	20%	50V
	C633	1-136-479-11	FILM	0.001µF	5%	100V
	C634	1-126-947-11	ELECT	47µF	20%	35V
	C635	1-126-963-11	ELECT	4.7µF	20%	50V
	C636	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
	C637	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
	C638	1-104-665-11	ELECT	100µF	20%	25V
	C640	1-164-645-11	CERAMIC	1000pF	10%	500V
	C642	1-126-969-11	ELECT	220µF	20%	50V
	C643	1-130-777-00	MYLAR	0.1µF	5%	100V
	C645	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
	C647	1-126-947-11	ELECT	47µF	20%	35V
	C648	1-104-330-91	CERAMIC	470pF	10%	1KV
		(ALL EXCEPT KV-21FM120)				
	C648	1-125-969-91	CERAMIC	680pF	10%	1KV
		(KV-21FM120 ONLY)				
	C650	1-126-942-61	ELECT	1000µF	20%	25V
	C651	1-126-942-61	ELECT	1000µF	20%	25V
	C652	1-164-227-11	CERAMIC CHIP	0.022µF	10%	25V
	C655	1-104-330-91	CERAMIC	470pF	10%	1KV
		(ALL EXCEPT KV-21FM120)				
	C655	1-125-969-91	CERAMIC	680pF	10%	1KV
		(KV-21FM120 ONLY)				
	C660	1-126-947-11	ELECT	47µF	20%	35V
	C661	1-104-665-11	ELECT	100µF	20%	25V
	C665	1-104-665-11	ELECT	100µF	20%	25V
	C672	1-137-756-22	FILM	22000pF	3%	800V
		(ALL EXCEPT KV-21FM120)				
	C672	1-165-608-11	FILM	15000pF	3%	800V
		(KV-21FM120 ONLY)				
	C673	1-126-963-11	ELECT	4.7µF	20%	50V
⚠	C680	1-117-699-11	CERAMIC	0.001µF	99%	250V
	C690	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V

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A

	REF. NO.	PART NO.	DESCRIPTION	VALUES
		CONNECTOR		
*	CN002	1-564-509-11	PLUG, CONNECTOR	6P
		(KV-21FA310LN/21FS310LS ONLY)		
*	CN002	1-564-510-11	PLUG, CONNECTOR	7P
		(ALL EXCEPT KV-21FA310LN/21FS310LS)		
*	CN003	1-560-124-00	PLUG, CONNECTOR (2.5MM)	4P
*	CN005	1-564-515-11	PLUG, CONNECTOR	12P
		(ALL EXCEPT KV-21FA310LN/21FS310LS)		
*	CN401	1-564-507-11	PLUG, CONNECTOR	4P
		(KV-21FA310LN/21FS310LS ONLY)		
*	CN501	1-508-786-00	PIN, CONNECTOR (5MM PITCH)	2P
*	CN515	1-580-798-11	CONNECTOR PIN (DY)	6P
		(ALL EXCEPT KV-21FA310LN/21FS310LS)		
*	CN586	1-564-509-11	PLUG, CONNECTOR	6P
⚠*	CN600	1-580-843-11	PIN, CONNECTOR (POWER)	
		DIODE		
	D002	8-719-109-89	DIODE	RD5.6ESB2
	D003	8-719-110-17	DIODE	RD10ESB2
	D004	8-719-110-17	DIODE	RD10ESB2
	D005	8-719-110-17	DIODE	RD10ESB2
	D006	8-719-921-44	DIODE	MTZJ-5.1C
	D007	8-719-982-22	DIODE	MTZJ-30D
	D046	8-719-109-89	DIODE	RD5.6ESB2
	D047	8-719-109-89	DIODE	RD5.6ESB2
	D050	8-719-510-02	DIODE	D1NS4
	D051	6-500-175-01	DIODE	1E3-TB
	D052	8-719-109-89	DIODE	RD5.6ESB2
	D200	8-719-929-15	DIODE	HZS9.1NB2
	D201	8-719-929-15	DIODE	HZS9.1NB2
	D202	8-719-929-15	DIODE	HZS9.1NB2
	D203	8-719-929-15	DIODE	HZS9.1NB2
	D206	8-719-070-62	DIODE	PDZ9.1B-115
		(KV-21FA310LN/21FS310LS ONLY)		
	D207	1-216-864-11	SHORT CHIP	
		(KV-21FA310LN/21FS310LS ONLY)		
	D207	8-719-404-50	DIODE	MA111-TX
		(ALL EXCEPT KV-21FA310LN/21FS310LS)		
	D208	8-719-929-15	DIODE	HZS9.1NB2
		(KV-21FA310LN/21FS310LS ONLY)		
	D209	1-216-864-11	SHORT CHIP	
		(KV-21FA310LN/21FS310LS ONLY)		

REF. NO.	PART NO.	DESCRIPTION	VALUES
D209	8-719-404-50	DIODE	MA111-TX
	(ALL EXCEPT KV-21FA310LN/21FS310LS)		
D230	8-719-108-12	DIODE	RD9.1EW
D231	8-719-108-12	DIODE	RD9.1EW
	(KV-21FA310LN/24FS120/25FS120LN/21FA310LS/25FS120LS ONLY)		
D232	8-719-108-12	DIODE	RD9.1EW
D234	8-719-108-12	DIODE	RD9.1EW
	(ALL EXCEPT KV-21FM120)		
D235	8-719-108-12	DIODE	RD9.1EW
	(ALL EXCEPT KV-21FM120)		
D236	8-719-108-12	DIODE	RD9.1EW
	(ALL EXCEPT KV-21FM120)		
D237	8-719-108-12	DIODE	RD9.1EW
	(KV-21FA310LN/24FS120/25FS120LN/21FA310LS/25FS120LS ONLY)		
D321	8-719-110-17	DIODE	RD10ESB2
D351	8-719-109-66	DIODE	RD3.3ESB2
D390	8-719-404-50	DIODE	MA111-TX
D401	8-719-921-63	DIODE	MTZJ-7.5B
D405	8-719-991-33	DIODE	1SS133T-77
D412	1-216-864-11	SHORT CHIP	
D414	8-719-921-63	DIODE	MTZJ-7.5B
	(KV-21FA310LN/21FA310LS ONLY)		
D420	8-719-072-68	DIODE	PDZ13B-115
D430	8-719-929-15	DIODE	HZS9.1NB2
	(ALL EXCEPT KV-21FM120)		
D431	8-719-929-15	DIODE	HZS9.1NB2
	(ALL EXCEPT KV-21FM120)		
D432	8-719-108-12	DIODE	RD9.1EW
	(ALL EXCEPT KV-21FA310LN/21FA310LS)		
D500	8-719-404-50	DIODE	MA111-TX
D501	8-719-404-50	DIODE	MA111-TX
D505	8-719-081-00	DIODE	BY228/A52A/
D506	8-719-979-85	DIODE	EGP20G
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)		
D506	6-500-485-01	DIODE	FR305G-E
	(KV-24FS120/25FS120LN/25FS120LS ONLY)		
D507	8-719-991-33	DIODE	1SS133T-77
D508	8-719-404-50	DIODE	MA111-TX
D513	8-719-404-50	DIODE	MA111-TX
D514	8-719-908-03	DIODE	GP08D
D515	8-719-908-03	DIODE	GP08D
D525	8-719-991-33	DIODE	1SS133T-77
D526	8-719-074-25	DIODE	PG104R
D528	8-719-991-33	DIODE	1SS133T-77

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REF. NO.	PART NO.	DESCRIPTION	VALUES
D545	8-719-908-03	DIODE	GP08D
D558	8-719-404-50	DIODE	MA111-TX
D559	8-719-404-50	DIODE	MA111-TX
D562	8-719-991-33	DIODE	1SS133T-77
D566	8-719-979-84	DIODE	EGP20DPKG23
D567	8-719-991-33	DIODE	1SS133T-77
D568	8-719-110-08	DIODE	RD8.2ESB2
D569	8-719-921-44	DIODE	MTZJ-5.1C
D587	8-719-074-25	DIODE	PG104R
D589	8-719-991-33	DIODE	1SS133T-77
D596	8-719-063-70	DIODE	D1NL20U
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)		
D596	6-500-531-01	DIODE	PG154R
	(KV-24FS120/25FS120LN/25FS120LS ONLY)		
D598	8-719-063-70	DIODE	D1NL20U
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)		
D598	6-500-531-01	DIODE	PG154R
	(KV-24FS120/25FS120LN/25FS120LS ONLY)		
D603	8-719-064-12	DIODE	S1NB60-4062
D604	6-500-890-01	DIODE	1N5406G-EB
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)		
D605	8-719-510-53	DIODE	D4SB60L
	(KV-21FA310LS/21FS120LS/25FS120LS ONLY)		
D606	6-500-890-01	DIODE	1N5406G-EB
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)		
D611	8-719-510-73	DIODE	S3L20µF4
D612	8-719-068-00	DIODE	ERC04-06SE
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)		
D613	8-719-068-00	DIODE	ERC04-06SE
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)		
D614	8-719-057-52	DIODE	EZ0150AV1
D615	6-500-177-01	DIODE	MA7D50
D618	8-719-979-64	DIODE	µF4005PKG23
D620	8-719-911-19	DIODE	1SS119-25
D621	8-719-510-37	DIODE	D5LC20U
D624	8-719-510-73	DIODE	S3L20µF4
D628	8-719-404-50	DIODE	MA111-TX
D629	8-719-110-31	DIODE	RD12ESB2
D631	6-500-175-01	DIODE	1E3-TB
D641	8-719-991-33	DIODE	1SS133T-77
D642	8-719-982-22	DIODE	MTZJ-30D
D644	8-719-110-31	DIODE	RD12ESB2
D645	8-719-109-89	DIODE	RD5.6ESB2
D650	8-719-109-89	DIODE	RD5.6ESB2

REF. NO.	PART NO.	DESCRIPTION	VALUES
	FUSE		
⚠ F601	1-576-193-11	FUSE	6.3A 125V
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)		
⚠ F601	1-532-506-51	FUSE	6.3A 250V
	(KV-21FA310LS/21FS120LS/25FS120LS ONLY)		
	FERRITE BEAD		
FB301	1-410-397-21	FERRITE	1.1µH
FB505	1-410-397-21	FERRITE	1.1µH
FB506	1-410-397-21	FERRITE	1.1µH
FB522	1-410-397-21	FERRITE	1.1µH
FB601	1-410-397-21	FERRITE	1.1µH
FB602	1-410-397-21	FERRITE	1.1µH
FB603	1-410-397-21	FERRITE	1.1µH
FB604	1-410-397-21	FERRITE	1.1µH
FB605	1-410-397-21	FERRITE	1.1µH
FB616	1-469-578-11	FERRITE	1.1µH
FB617	1-469-578-11	FERRITE	1.1µH
	FILTER		
FL001	1-239-803-11	ENCAPSULATED	COMPONENT
	IC		
⚠ IC001	6-804-178-01	IC	M65582AµF-XXXFP
IC002	6-704-004-01	IC	BR24L16F-WE2
IC003	8-759-352-91	IC	PST9143NL
IC321	8-759-353-00	IC	NJM2534M(TE2)
IC400	6-706-033-01	IC	NJW1172JK1-TE2
	(KV-21FA310LN/21FA310LS ONLY)		
IC401	6-706-032-01	IC	NJW1142M(TE2)
	(ALL EXCEPT KV-21FA310LN/21FA310LS ONLY)		
IC404	6-705-054-01	IC	TDA8947J
IC545	6-703-470-01	IC	STV9302A
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)		
IC545	8-759-696-71	IC	STV9379A
	(KV-24FS120/25FS120LN/25FS120LS ONLY)		
⚠ IC561	8-759-700-07	IC	NJM2903M
IC565	8-759-700-44	IC	NJM2902M
IC600	6-705-810-01	IC	MCZ3001DB
IC603	6-705-466-01	IC	BA90BC0T
	(KV-21FA310LN/21FA310LS ONLY)		
IC603	6-705-818-01	IC	MC7809CF
	(ALL EXCEPT KV-21FA310LN/21FA310LS)		

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	REF. NO.	PART NO.	DESCRIPTION	VALUES
⚠	IC604	8-749-012-13	IC	DM-58
	IC608	8-759-450-47	IC	BA05T
	IC633	6-703-080-01	IC	LF33CV
		JACK		
	J200	1-794-115-11	JACK BLOCK	2P
		(KV-21FM120 ONLY)		
	J200	1-794-118-11	JACK BLOCK	3P
		(KV-20FS120/21FS120LN/21FS120LS ONLY)		
	J200	1-794-119-11	TERMINAL BLOCK, S	4P
		(KV-21FA310LN/24FS120/25FS120LN/21FA310LS/25FS120LS ONLY)		
	J201	1-794-048-11	JACK, PIN	3P
		(KV-21FA310LN/21FA310LS ONLY)		
*	J203	1-817-461-11	PIN JACK BLOCK	5P
		(ALL EXCEPT KV-21FM120)		
*	J205	1-818-352-11	PIN JACK W/DIN CONNECTOR	
		(KV-21FA310LN/21FA310LS ONLY)		
	J401	1-750-264-11	JACK	
		(KV-21FA310LN/21FA310LS ONLY)		
		CHIP CONDUCTOR		
	JR2	1-216-864-11	SHORT CHIP	
	JR6	1-216-864-11	SHORT CHIP	
	JR7	1-216-864-11	SHORT CHIP	
	JR12	1-216-864-11	SHORT CHIP	
	JR44	1-216-864-11	SHORT CHIP	
	JR102	1-216-864-11	SHORT CHIP	
	JR128	1-216-864-11	SHORT CHIP	
	JR201	1-216-864-11	SHORT CHIP	
	JR207	1-216-864-11	SHORT CHIP	
		(ALL EXCEPT KV-21FM120)		
	JR209	1-216-864-11	SHORT CHIP	
	JR211	1-216-864-11	SHORT CHIP	
	JR212	1-216-864-11	SHORT CHIP	
	JR213	1-216-864-11	SHORT CHIP	
	JR214	1-216-864-11	SHORT CHIP	
	JR215	1-216-864-11	SHORT CHIP	
	JR255	1-216-864-11	SHORT CHIP	
	JR301	1-216-864-11	SHORT CHIP	
	JR302	1-216-864-11	SHORT CHIP	
	JR303	1-216-864-11	SHORT CHIP	
	JR304	1-216-864-11	SHORT CHIP	
	JR305	1-216-864-11	SHORT CHIP	
	JR306	1-216-864-11	SHORT CHIP	
	JR310	1-216-864-11	SHORT CHIP	
	JR311	1-216-864-11	SHORT CHIP	
	JR312	1-216-864-11	SHORT CHIP	
		(ALL EXCEPT KV-21FM120)		
	JR315	1-216-864-11	SHORT CHIP	
	JR317	1-216-864-11	SHORT CHIP	
	JR401	1-216-864-11	SHORT CHIP	
		(ALL EXCEPT KV-21FM120)		
	JR402	1-216-864-11	SHORT CHIP	
		(ALL EXCEPT KV-21FM120)		
	JR403	1-216-864-11	SHORT CHIP	
		(ALL EXCEPT KV-21FM120)		
	JR411	1-216-864-11	SHORT CHIP	
	JR485	1-216-864-11	SHORT CHIP	
	JR486	1-216-864-11	SHORT CHIP	
	JR504	1-216-864-11	SHORT CHIP	
	JR585	1-216-864-11	SHORT CHIP	
	JR586	1-216-864-11	SHORT CHIP	
	JR1502	1-216-864-11	SHORT CHIP	
		JUMPER WIRE		
	JW57	1-249-409-11	CARBON	220 5% 1/4W
		COIL		
	L002	1-239-803-11	ENCAPSULATED	COMPONENT
	L003	1-239-803-11	ENCAPSULATED	COMPONENT
	L004	1-239-803-11	ENCAPSULATED	COMPONENT
	L005	1-239-803-11	ENCAPSULATED	COMPONENT
	L006	1-414-273-11	INDUCTOR	100µH
	L007	1-414-273-11	INDUCTOR	100µH
	L008	1-414-857-11	INDUCTOR	100µH
	L009	1-414-857-11	INDUCTOR	100µH
	L010	1-414-267-21	INDUCTOR	10µH
	L011	1-239-803-11	ENCAPSULATED	COMPONENT
	L101	1-414-229-11	FERRITE	0µH
⚠	L510	1-406-981-21	INDUCTOR	470µH
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)		
	L513	1-406-677-11	INDUCTOR	10MH
	L515	1-412-552-11	INDUCTOR	2.2MH

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REF. NO.	PART NO.	DESCRIPTION	VALUES
L516	1-406-978-11	INDUCTOR	150µH
	(KV-24FS120/25FS120LN/25FS120LS ONLY)		
L525	1-409-955-31	INDUCTOR	8MH
L527	1-410-397-21	FERRITE	1.1µH
L588	1-412-528-11	INDUCTOR	18µH
L606	1-412-525-31	INDUCTOR	10µH
L607	1-412-525-31	INDUCTOR	10µH
L608	1-412-533-21	INDUCTOR	47µH
L609	1-412-525-31	INDUCTOR	10µH
	PHOTO COUPLER		
⚠ PH602	8-749-010-64	PHOTO COUPLER	PC123F2
	IC LINK		
PS401	1-576-337-21	IC LINK	2.7A 50V
	TRANSISTOR		
Q002	8-729-422-27	TRANSISTOR	2SD601A-Q
Q004	8-729-422-27	TRANSISTOR	2SD601A-Q
Q005	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q006	8-729-422-27	TRANSISTOR	2SD601A-Q
Q008	8-729-422-27	TRANSISTOR	2SD601A-Q
Q009	8-729-422-27	TRANSISTOR	2SD601A-Q
Q300	8-729-422-27	TRANSISTOR	2SD601A-Q
Q301	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q303	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q304	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q305	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q306	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q316	8-729-422-27	TRANSISTOR	2SD601A-Q
Q390	8-729-422-27	TRANSISTOR	2SD601A-Q
Q391	8-729-422-27	TRANSISTOR	2SD601A-Q
Q400	8-729-422-27	TRANSISTOR	2SD601A-Q
	(KV-21FA310LN/21FA310LS ONLY)		
Q401	8-729-422-27	TRANSISTOR	2SD601A-Q
	(KV-21FA310LN/21FA310LS ONLY)		
Q403	8-729-422-27	TRANSISTOR	2SD601A-Q
	(KV-21FA310LN/21FA310LS ONLY)		
Q404	8-729-422-27	TRANSISTOR	2SD601A-Q
Q411	8-729-422-27	TRANSISTOR	2SD601A-Q
Q412	8-729-422-27	TRANSISTOR	2SD601A-Q
	(KV-21FA310LN/21FA310LS ONLY)		
Q420	8-729-422-27	TRANSISTOR	2SD601A-Q
Q421	8-729-422-27	TRANSISTOR	2SD601A-Q
Q501	8-729-423-33	TRANSISTOR	2SC3311A-QRSTA
Q502	8-729-140-50	TRANSISTOR	2SC3209LK
Q503	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q504	8-729-422-27	TRANSISTOR	2SD601A-Q
Q505	6-550-041-01	TRANSISTOR	2SD2634-Y
	(KV-24FS120/25FS120LN/25FS120LS ONLY)		
⚠ Q506	6-550-042-01	TRANSISTOR	2SD2627LS-YB11
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)		
Q519	8-729-422-27	TRANSISTOR	2SD601A-Q
Q521	8-729-423-33	TRANSISTOR	2SC3311A-QRSTA
Q522	8-729-053-87	TRANSISTOR	KTC4370A
Q531	8-729-422-27	TRANSISTOR	2SD601A-Q
Q533	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q572	8-729-422-27	TRANSISTOR	2SD601A-Q
Q573	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q578	8-729-422-27	TRANSISTOR	2SD601A-Q
Q590	6-550-362-01	TRANSISTOR	KTA1279
Q600	8-729-053-36	TRANSISTOR	2SK2640-01MR-F122
	(ALL EXCEPT KV-21FM120)		
Q600	8-729-052-29	TRANSISTOR	2SK2876-01MR-F122
	(KV-21FM120 ONLY)		
Q601	8-729-053-36	TRANSISTOR	2SK2640-01MR-F122
	(ALL EXCEPT KV-21FM120)		
Q601	8-729-052-29	TRANSISTOR	2SK2876-01MR-F122
	(KV-21FM120 ONLY)		
Q604	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q608	8-729-922-37	TRANSISTOR	2SD2144S-UVW
Q650	6-550-409-01	TRANSISTOR	KSC2383-O
Q860	8-729-422-27	TRANSISTOR	2SD601A-Q
	RESISTOR		
R002	1-216-864-11	SHORT CHIP	
R003	1-216-821-11	METAL CHIP	1K 5% 1/10W
R004	1-216-817-11	METAL CHIP	470 5% 1/10W
R005	1-400-427-21	FERRITE	0µH
R006	1-216-829-11	METAL CHIP	4.7K 5% 1/10W
R007	1-400-427-21	FERRITE	0µH
R015	1-216-833-11	METAL CHIP	10K 5% 1/10W
R027	1-218-732-11	METAL CHIP	47K 0.50% 1/10W

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
R028	1-249-409-11	CARBON	220	5%	1/4W
R029	1-249-409-11	CARBON	220	5%	1/4W
	(ALL EXCEPT KV-21FM120)				
R030	1-249-409-11	CARBON	220	5%	1/4W
	(ALL EXCEPT KV-21FM120)				
R031	1-216-813-11	METAL CHIP	220	5%	1/10W
R032	1-216-813-11	METAL CHIP	220	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R033	1-249-409-11	CARBON	220	5%	1/4W
R035	1-216-809-11	METAL CHIP	100	5%	1/10W
R037	1-216-833-11	METAL CHIP	10K	5%	1/10W
R038	1-216-821-11	METAL CHIP	1K	5%	1/10W
R039	1-216-815-11	METAL CHIP	330	5%	1/10W
R040	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R041	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R042	1-216-813-11	METAL CHIP	220	5%	1/10W
R043	1-216-813-11	METAL CHIP	220	5%	1/10W
R044	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R045	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R047	1-249-409-11	CARBON	220	5%	1/4W
R048	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R049	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R050	1-249-425-11	CARBON	4.7K	5%	1/4W
R051	1-249-417-11	CARBON	1K	5%	1/4W
R052	1-216-813-11	METAL CHIP	220	5%	1/10W
R053	1-249-433-11	CARBON	22K	5%	1/4W
R054	1-249-433-11	CARBON	22K	5%	1/4W
R055	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R056	1-216-833-11	METAL CHIP	10K	5%	1/10W
R057	1-249-417-11	CARBON	1K	5%	1/4W
R058	1-249-429-11	CARBON	10K	5%	1/4W
R059	1-249-417-11	CARBON	1K	5%	1/4W
R060	1-249-409-11	CARBON	220	5%	1/4W
	(ALL EXCEPT KV-21FM120)				
R061	1-249-429-11	CARBON	10K	5%	1/4W
R062	1-249-413-11	CARBON	470	5%	1/4W
R063	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R065	1-249-415-11	CARBON	680	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R067	1-249-416-11	CARBON	820	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R069	1-249-421-11	CARBON	2.2K	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R070	1-249-409-11	CARBON	220	5%	1/4W

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R071	1-249-427-11	CARBON	6.8K	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R072	1-249-425-11	CARBON	4.7K	5%	1/4W
R073	1-249-419-11	CARBON	1.5K	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R074	1-249-421-11	CARBON	2.2K	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R075	1-249-427-11	CARBON	6.8K	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R076	1-247-807-31	CARBON	100	5%	1/4W
R080	1-216-833-11	METAL CHIP	10K	5%	1/10W
R081	1-216-841-11	METAL CHIP	47K	5%	1/10W
R082	1-216-857-11	METAL CHIP	1M	5%	1/10W
R083	1-216-847-11	METAL CHIP	150K	5%	1/10W
R084	1-216-819-11	METAL CHIP	680	5%	1/10W
R085	1-216-864-11	SHORT CHIP			
R086	1-216-821-11	METAL CHIP	1K	5%	1/10W
R087	1-247-807-31	CARBON	100	5%	1/4W
R088	1-216-864-11	SHORT CHIP			
R090	1-216-837-11	METAL CHIP	22K	5%	1/10W
R091	1-216-841-11	METAL CHIP	47K	5%	1/10W
R092	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R093	1-216-841-11	METAL CHIP	47K	5%	1/10W
R094	1-414-229-11	FERRITE	0µH		
R095	1-216-813-11	METAL CHIP	220	5%	1/10W
R096	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R098	1-216-839-11	METAL CHIP	33K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R098	1-216-837-11	METAL CHIP	22K	5%	1/10W
	(KV-21FM120 ONLY)				
R101	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R101	1-216-832-11		8.2K	5%	1/10W
	(KV-21FM120 ONLY)				
R102	1-216-837-11	METAL CHIP	22K	5%	1/10W
R103	1-216-833-11	METAL CHIP	10K	5%	1/10W
R104	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R105	1-216-864-11	SHORT CHIP			
	(ALL EXCEPT KV-21FM120)				
R106	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R107	1-414-229-11	FERRITE	0µH		
R108	1-414-229-11	FERRITE	0µH		

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
R109	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R110	1-249-409-11	CARBON	220	5%	1/4W
R111	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R112	1-249-425-11	CARBON	4.7K	5%	1/4W
R115	1-216-817-11	METAL CHIP	470	5%	1/10W
R116	1-216-853-11	METAL CHIP	470K	5%	1/10W
R200	1-216-813-11	METAL CHIP	220	5%	1/10W
R202	1-216-845-11	METAL CHIP	100K	5%	1/10W
R203	1-216-845-11	METAL CHIP	100K	5%	1/10W
R206	1-216-845-11	METAL CHIP	100K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R207	1-216-845-11	METAL CHIP	100K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R208	1-249-409-11	CARBON	220	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R209	1-249-409-11	CARBON	220	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R215	1-216-853-11	METAL CHIP	470K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R216	1-216-853-11	METAL CHIP	470K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R217	1-249-409-11	CARBON	220	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R218	1-216-813-11	METAL CHIP	220	5%	1/10W
R220	1-216-813-11	METAL CHIP	220	5%	1/10W
R221	1-249-409-11	CARBON	220	5%	1/4W
R222	1-249-409-11	CARBON	220	5%	1/4W
R226	1-218-285-11	METAL CHIP	75	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R227	1-218-285-11	METAL CHIP	75	5%	1/10W
	(KV-21FA310LN/21FA310LS/24FS120/25FS120LN/25FS120LS ONLY)				
R229	1-218-285-11	METAL CHIP	75	5%	1/10W
	(KV-21FA310LN/21FA310LS/24FS120/25FS120LN/25FS120LS ONLY)				
R230	1-218-285-11	METAL CHIP	75	5%	1/10W
R234	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R250	1-216-821-11	METAL CHIP	1K	5%	1/10W
R251	1-216-821-11	METAL CHIP	1K	5%	1/10W
R301	1-216-864-11	SHORT CHIP			
	(KV-20FS120/21FS12LN/21FM120/21FS120LS ONLY)				
R302	1-216-864-11	SHORT CHIP			
	(KV-20FS120/21FS12LN/21FM120/21FS120LS ONLY)				
R303	1-216-863-11	METAL CHIP	3.3M	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R305	1-218-285-11	METAL CHIP	75	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R305	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R308	1-216-821-11	METAL CHIP	1K	5%	1/10W
R309	1-216-833-11	METAL CHIP	10K	5%	1/10W
R310	1-216-821-11	METAL CHIP	1K	5%	1/10W
R311	1-216-813-11	METAL CHIP	220	5%	1/10W
R312	1-218-867-11	METAL CHIP	6.8K	0.50%	1/10W
R313	1-216-864-11	SHORT CHIP			
R314	1-216-833-11	METAL CHIP	10K	5%	1/10W
R315	1-216-813-11	METAL CHIP	220	5%	1/10W
R316	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R317	1-216-813-11	METAL CHIP	220	5%	1/10W
R318	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R319	1-216-813-11	METAL CHIP	220	5%	1/10W
R320	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R321	1-247-807-31	CARBON	100	5%	1/4W
R322	1-218-684-11	METAL CHIP	470	0.50%	1/10W
R323	1-215-415-00	METAL	560	1%	1/4W
R324	1-216-821-11	METAL CHIP	1K	5%	1/10W
R325	1-216-864-11	SHORT CHIP			
R326	1-400-427-21	FERRITE	0µH		
R328	1-400-427-21	FERRITE	0µH		
R335	1-216-813-11	METAL CHIP	220	5%	1/10W
R337	1-216-801-11	METAL CHIP	22	5%	1/10W
R338	1-216-864-11	SHORT CHIP			
R351	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R352	1-216-853-11	METAL CHIP	470K	5%	1/10W
R363	1-218-285-11	METAL CHIP	75	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R363	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R364	1-218-285-11	METAL CHIP	75	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R364	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R370	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R371	1-216-849-11	METAL CHIP	220K	5%	1/10W
R372	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R382	1-216-863-11	METAL CHIP	3.3M	5%	1/10W
	(ALL EXCEPT KV-21FM120)				

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
R390	1-216-864-11	SHORT CHIP			
R391	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R392	1-216-818-11	METAL CHIP	560	5%	1/10W
R393	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R394	1-216-833-11	METAL CHIP	10K	5%	1/10W
R400	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R401	1-216-809-11	METAL CHIP	100	5%	1/10W
R402	1-216-864-11	SHORT CHIP			
	(KV-21FA310LN/21FA310LS ONLY)				
R403	1-216-809-11	METAL CHIP	100	5%	1/10W
R404	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R404	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	(KV-21FM120 ONLY)				
R405	1-216-833-11	METAL CHIP	10K	5%	1/10W
R406	1-216-813-11	METAL CHIP	220	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R407	1-216-813-11	METAL CHIP	220	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R408	1-216-864-11	SHORT CHIP			
R409	1-216-864-11	SHORT CHIP			
R410	1-216-833-11	METAL CHIP	10K	5%	1/10W
R411	1-216-833-11	METAL CHIP	10K	5%	1/10W
R414	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R415	1-216-809-11	METAL CHIP	100	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R416	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R417	1-216-864-11	SHORT CHIP			
	(KV-21FA310LN/21FA310LS ONLY)				
R418	1-216-809-11	METAL CHIP	100	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R421	1-216-864-11	SHORT CHIP			
R422	1-216-833-11	METAL CHIP	10K	5%	1/10W
R423	1-216-813-11	METAL CHIP	220	5%	1/10W
R424	1-216-841-11	METAL CHIP	47K	5%	1/10W
R425	1-216-833-11	METAL CHIP	10K	5%	1/10W
R427	1-216-841-11	METAL CHIP	47K	5%	1/10W
R429	1-216-841-11	METAL CHIP	47K	5%	1/10W
R430	1-216-845-11	METAL CHIP	100K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R431	1-216-845-11	METAL CHIP	100K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R433	1-216-809-11	METAL CHIP	100	5%	1/10W
R434	1-216-864-11	SHORT CHIP			
	(KV-21FA310LN/21FA310LS ONLY)				
R434	1-216-805-11	METAL CHIP	47	5%	1/10W
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
R439	1-216-845-11	METAL CHIP	100K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R440	1-249-413-11	CARBON	470	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R441	1-249-413-11	CARBON	470	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R442	1-216-809-11	METAL CHIP	100	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R443	1-216-841-11	METAL CHIP	47K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R450	1-249-425-11	CARBON	4.7K	5%	1/4W
R477	1-216-819-11	METAL CHIP	680	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R478	1-216-833-11	METAL CHIP	10K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R479	1-216-821-11	METAL CHIP	1K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R499	1-216-845-11	METAL CHIP	100K	5%	1/10W
R501	1-249-411-11	CARBON	330	5%	1/4W
R502	1-249-425-11	CARBON	4.7K	5%	1/4W
R503	1-215-921-11	METAL OXIDE	4.7K	5%	3W
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
R503	1-215-919-11	METAL OXIDE	2.2K	5%	3W
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
R504	1-249-425-11	CARBON	4.7K	5%	1/4W
R507	1-216-833-11	METAL CHIP	10K	5%	1/10W
R510	1-260-320-11	CARBON	220	5%	1/2W
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
R510	1-260-328-11	CARBON	1K		
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
R512	1-215-910-00	METAL OXIDE	68	5%	3W
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
R513	1-215-913-11	METAL OXIDE	220	5%	3W
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
R513	1-215-908-00	METAL OXIDE	33	5%	3W
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

A component identified by this ⋈ symbol indicates that it has been carefully factory-selected to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

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	REF. NO.	PART NO.	DESCRIPTION	VALUES		
	R514	1-215-910-00	METAL OXIDE	68	5%	3W
	R515	1-215-886-11	METAL OXIDE	100	5%	2W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R515	1-215-885-00	METAL OXIDE	68		
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R517	1-218-883-11	METAL CHIP	33K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R517	1-216-837-11	METAL CHIP	22K	5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R518	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R519	1-218-877-11	METAL CHIP	18K	0.50%	1/10W
	R520	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R521	1-216-819-11	METAL CHIP	680	5%	1/10W
	R522	1-249-411-11	CARBON	330	5%	1/4W
	R524	1-218-867-11	METAL CHIP	6.8K	0.50%	1/10W
	R525	1-215-861-00	METAL OXIDE	47	5%	1W
	R526	1-218-724-11	METAL CHIP	22K	0.50%	1/10W
	R527	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
⚠	R528	1-218-867-11	METAL CHIP	6.8K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
⚠	R528	1-218-816-11	METAL CHIP	390	5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R529	1-218-724-11	METAL CHIP	22K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R529	1-218-720-11	METAL CHIP	15K	0.50%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R530	1-218-873-11	METAL CHIP	12K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R530	1-218-708-11	METAL CHIP	4.7K	0.50%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R533	1-216-826-11	METAL CHIP	2.7K	5%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R533	1-216-833-11	METAL CHIP	10K	5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R534	1-218-720-11	METAL CHIP	15K	0.50%	1/10W
	R535	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R535	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R536	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R537	1-216-857-11	METAL CHIP	1M	5%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R537	1-216-849-11	METAL CHIP	220K	5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R538	1-216-851-11	METAL CHIP	330K	5%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R539	1-216-864-11	SHORT CHIP			
	R540	1-249-429-11	CARBON	10K	5%	1/4W
	R541	1-218-720-11	METAL CHIP	15K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R541	1-218-714-11	METAL CHIP	8.2K	0.5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R542	1-215-445-00	METAL	10K	1%	1/4W
	R543	1-216-351-00	METAL OXIDE	1.5	5%	1W
	R544	1-249-389-11	CARBON	4.7	5%	1/4W
	R545	1-215-890-11	METAL OXIDE	470	5%	2W
	R546	1-249-385-11	CARBON	2.2	5%	1/4W
	R547	1-215-445-00	METAL	10K	1%	1/4W
	R548	1-218-720-11	METAL CHIP	15K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R548	1-218-714-11	METAL CHIP	8.2K	0.5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R549	1-216-841-11	METAL CHIP	47K	5%	1/10W
	R550	1-216-817-11	METAL CHIP	470	5%	1/10W
	R551	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	R552	1-216-845-11	METAL CHIP	100K	5%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R553	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R554	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
	R555	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R556	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
	R557	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
	R559	1-216-837-11	METAL CHIP	22K	5%	1/10W
	R560	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R561	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R562	1-249-429-11	CARBON	10K	5%	1/4W
	R563	1-218-871-11	METAL CHIP	10K	0.50%	1/10W
	R564	1-218-738-11	METAL CHIP	82K	0.5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
⋈	R565	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
	R566	1-215-469-00	METAL	100K	1%	1/4W
⚠	R567	1-215-879-11	METAL OXIDE	47K	5%	1W
	R568	1-215-416-00	METAL	620	1%	1/4W
	R569	1-249-429-11	CARBON	10K	5%	1/4W
	R570	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
	R572	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	R573	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	R574	1-216-833-11	METAL CHIP	10K	5%	1/10W

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	REF. NO.	PART NO.	DESCRIPTION	VALUES		
	R575	1-249-389-11	CARBON	4.7	5%	1/4W
	R578	1-249-429-11	CARBON	10K	5%	1/4W
	R580	1-216-837-11	METAL CHIP	22K	5%	1/10W
	R581	1-249-441-11	CARBON	100K	5%	1/4W
	R583	1-249-377-11	CARBON	0.47	5%	1/4W
	R584	1-215-453-00	METAL	22K	1%	1/4W
	R585	1-215-453-00	METAL	22K	1%	1/4W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R585	1-215-449-00	METAL	15K	1%	1/4W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R586	1-218-855-11	METAL CHIP	2.2K	0.50%	1/10W
	R587	1-249-401-11	CARBON	47	5%	1/4W
	R588	1-215-882-00	METAL OXIDE	22	5%	2W
	R589	1-247-895-91	CARBON	470K	5%	1/4W
	R590	1-249-429-11	CARBON	10K	5%	1/4W
	R591	1-216-365-00	METAL OXIDE	0.47	5%	2W
	R592	1-249-441-11	CARBON	100K	5%	1/4W
	R593	1-249-429-11	CARBON	10K	5%	1/4W
⚠	R594	1-249-417-11	CARBON	1K	5%	1/4W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
⚠	R594	1-249-418-11	CARBON	1.2K	5%	1/4W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R595	1-247-895-91	CARBON	470K	5%	1/4W
	R596	1-249-377-11	CARBON	0.47	5%	1/4W
	R597	1-216-849-11	METAL CHIP	220K	5%	1/10W
	R598	1-249-377-11	CARBON	0.47	5%	1/4W
	R599	1-216-837-11	METAL CHIP	22K	5%	1/10W
⚠	R603	1-219-513-11	METAL	4.7M	5%	1/2W
		(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)				
	R604	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R605	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R606	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R607	1-216-857-11	METAL CHIP	1M	5%	1/10W
	R608	1-215-924-00	METAL OXIDE	15K	5%	3W
	R609	1-245-670-11	CEMENT RESISTOR	4.7		
		(KV-21FA310LN/21FA310LS ONLY)				
	R609	1-202-962-11	CEMENT RESISTOR	3.3	5%	10W
		(ALL EXCEPT KV-21FA310LN/21FA310LS)				
	R611	1-202-961-11	CEMENTED	1.8	5%	10W
		(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)				
	R611	1-244-206-11	CEMENTED	2.2	5%	10W
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				
	R612	1-260-131-11	CEMENTED	470K	5%	1/2W
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				

	REF. NO.	PART NO.	DESCRIPTION	VALUES		
	R613	1-202-961-11	CEMENTED	1.8	5%	10W
		(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)				
	R613	1-244-206-11	CEMENTED	2.2	5%	10W
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				
	R614	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
⚠	R615	1-202-933-61	FUSIBLE	0.1	10%	1/2W
	R616	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R617	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R619	1-249-389-11	CARBON	4.7	5%	1/4W
	R620	1-216-353-00	METAL OXIDE	2.2	5%	1W
	R625	1-249-413-11	CARBON	470	5%	1/4W
	R626	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
	R627	1-215-481-00	METAL	330K	1%	1/4W
	R628	1-260-131-11	CEMENTED	470K	5%	1/2W
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				
	R629	1-215-481-00	METAL	330K	1%	1/4W
	R630	1-215-481-00	METAL	330K	1%	1/4W
	R631	1-218-718-11	METAL CHIP	12K	0.50%	1/10W
	R632	1-216-809-11	METAL CHIP	100	5%	1/10W
	R634	1-215-905-11	METAL OXIDE	10	5%	3W
	R640	1-249-417-11	CARBON	1K	5%	1/4W
	R641	1-240-262-11	CEMENTED	0.68	5%	10W
		(KV-21FA310LN/20FS120/21FS120LN/24FS120/25FS120LN ONLY)				
	R641	1-244-206-11	CEMENTED	2.2	5%	10W
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				
	R641	1-205-998-11	CEMENTED	1	5%	10W
		(KV-21FM120 ONLY)				
	R647	1-216-811-11	METAL CHIP	150	5%	1/10W
	R650	1-249-415-11	CARBON	680	5%	1/4W
	R651	1-249-441-11	CARBON	100K	5%	1/4W
	R652	1-249-441-11	CARBON	100K	5%	1/4W
	R658	1-249-393-11	CARBON	10	5%	1/4W
	R659	1-249-393-11	CARBON	10	5%	1/4W
	R660	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R667	1-216-833-11	METAL CHIP	10K	5%	1/10W
⚠	R668	1-249-418-11	CARBON	1.2K	5%	1/4W
	R670	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R671	1-243-979-71	METAL OXIDE	0.1	5%	2W
⚠	R699	1-218-265-11	METAL CHIP	8.2M	5%	1W
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				
	R680	1-216-864-11	SHORT CHIP			
	R801	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
	R802	1-218-877-11	METAL CHIP	18K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
R802	1-218-871-11	METAL CHIP	10K	0.50%	1/10W
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
R803	1-218-719-11	METAL CHIP	13K	0.50%	1/10W
R804	1-249-435-11	CARBON	33K	5%	1/4W
R812	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
R813	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
R814	1-218-736-11	METAL CHIP	68K	0.50%	1/10W
R815	1-218-732-11	METAL CHIP	47K	0.50%	1/10W
R850	1-215-453-00	METAL	22K	1%	1/4W
R851	1-216-821-11	METAL CHIP	1K	5%	1/10W
R852	1-218-869-11	METAL CHIP	8.2K	0.50%	1/10W
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
R860	1-216-833-11	METAL CHIP	10K	5%	1/10W
R861	1-216-833-11	METAL CHIP	10K	5%	1/10W
R862	1-216-813-11	METAL CHIP	220	5%	1/10W
R893	1-216-864-11	SHORT CHIP			

RELAY

RY501	1-755-198-11	RELAY, AC POWER	
⚠ RY600	1-755-395-11	RELAY (AC POWER)	

SWITCH

S002	1-692-431-21	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
S003	1-692-431-21	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
S004	1-692-431-21	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
S005	1-692-431-21	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
S006	1-692-431-21	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
S007	1-762-816-11	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
S008	1-762-816-11	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
SW515	1-572-707-11	SWITCH, LEVER	

TRANSFORMER

T505	1-433-836-11	TRANSFORMER, HORIZONTAL DRIVE
T510	1-437-610-11	TRANSFORMER, FERRITE
	(KV-24FS120/25FS120LN/25FS120LS ONLY)	
⚠ T511	1-435-079-21	TRANSFORMER, HORIZONTAL LINEAR
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)	
⚠ T511	1-433-850-11	TRANSFORMER, HORIZONTAL LINEAR
	(KV-24FS120/25FS120LN/25FS120LS ONLY)	
⚠ T585	1-453-316-21	FBT ASSY NX-1748//X4A4
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)	
⚠ T585	1-453-336-11	FBT ASSY NX-4011//X4A4
	(KV-24FS120/25FS120LN/25FS120LS ONLY)	
⚠ T601	1-435-617-11	TRANSFORMER, LINE FILTER
⚠ T602	1-435-675-11	TRANSFORMER, STANDBY
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)	
⚠ T602	1-435-676-11	TRANSFORMER, STANDBY
	(KV-21FA310LS/21FS120LS/25FS120LS ONLY)	
⚠ T603	1-439-898-21	CONVERTER TRANSFORMER
	(ALL EXCEPT KV-21FM120)	
⚠ T603	1-437-609-11	CONVERTER TRANSFORMER
	(KV-21FM120 ONLY)	

THERMISTOR

⚠ THP501	1-809-539-11	THERMISTOR, POSITIVE
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)	
⚠ THP501	1-809-540-11	THERMISTOR, POSITIVE
	(KV-21FA310LS/21FS120LS/25FS120LS ONLY)	

TUNER

⚠ TU101	8-598-593-50	TUNER, FSS BTF-WA421
	(ALL EXCEPT KV-21FM120)	
⚠ TU101	8-598-594-30	TUNER, FSS BTF-FA421
	(KV-21FM120 ONLY)	

VARISTOR

⚠ VDR600	1-810-974-21	VARISTOR
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)	
⚠ VDR600	1-803-967-11	VARISTOR
	(KV-21FA310LS/21FS120LS/25FS120LS ONLY)	

CRYSTAL

X001	1-795-006-21	VIBRATOR, CRYSTAL
X301	1-781-377-21	VIBRATOR, CRYSTAL

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CV

CV

REF. NO.	PART NO.	DESCRIPTION	VALUES		
*	**A-1410-919-A**	**CV (VAR) BOARD, MOUNTED**			
	(KV-20FS120/21FA310LN/21FA310LS/21FM120/21FS120LN/21FS120LS ONLY)				
*	**A-1415-605-A**	**CV (VAR) BOARD, MOUNTED**			
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	4-382-854-11	SCREW (M3X10), P, SW (+)			
		CAPACITOR			
	C901	1-107-667-11	ELECT	2.2µF	20% 400V
	C902	1-130-491-00	MYLAR	0.047µF	5% 50V
	C903	1-126-935-11	ELECT	470µF	20% 16V
	C904	1-130-471-00	MYLAR	0.001µF	5% 50V
	C905	1-106-383-00	MYLAR	0.047µF	10% 200V
	C906	1-130-471-00	MYLAR	0.001µF	5% 50V
	C907	1-107-638-11	ELECT	33µF	20% 160V
	C908	1-126-935-11	ELECT	470µF	20% 16V
	C909	1-161-830-00	CERAMIC	0.0047µF	500V
	C910	1-104-999-11	MYLAR	0.1µF	5% 200V
	C911	1-104-665-11	ELECT	100µF	20% 25V
	C912	1-126-942-61	ELECT	1000µF	20% 25V
	C914	1-130-491-00	MYLAR	0.047µF	5% 50V
	C915	1-162-970-11	CERAMIC CHIP	0.01µF	10% 25V
	C1751	1-107-652-11	ELECT	10µF	20% 250V
	C1752	1-162-114-00	CERAMIC	0.0047µF	2KV
	C1753	1-137-528-11	MYLAR	0.1µF	10% 250V
	C1754	1-102-074-00	CERAMIC	0.001µF	10% 50V
	C1755	1-107-649-11	ELECT	2.2µF	20% 250V
	C1774	1-126-960-11	ELECT	1µF	20% 50V
	C1775	1-126-935-11	ELECT	470µF	20% 16V
	C1777	1-126-963-11	ELECT	4.7µF	20% 50V
	C1778	1-126-947-11	ELECT	47µF	20% 35V
		CONNECTOR			
*	CN903	1-564-506-11	PLUG, CONNECTOR	3P	
	CN1707	1-564-506-11	PLUG, CONNECTOR	3P	
*	CN1752	1-564-512-11	PLUG, CONNECTOR	9P	
	CN1753	1-785-879-11	CONNECTOR, ONE TOUCH		
	CN1755	1-695-915-11	TAB (CONTACT)		

REF. NO.	PART NO.	DESCRIPTION	VALUES
		DIODE	
D762	8-719-404-50	DIODE	MA111-TX
D763	8-719-404-50	DIODE	MA111-TX
D772	8-719-404-50	DIODE	MA111-TX
D773	8-719-404-50	DIODE	MA111-TX
D782	8-719-404-50	DIODE	MA111-TX
D783	8-719-404-50	DIODE	MA111-TX
D901	8-719-110-86	DIODE	RD39ESB
D902	8-719-110-86	DIODE	RD39ESB
D903	8-719-991-33	DIODE	1SS133T-77
D1701	8-719-108-12	DIODE	RD9.1EW
D1754	8-719-901-83	DIODE	1SS83
D1755	8-719-901-83	DIODE	1SS83
D1756	8-719-901-83	DIODE	1SS83
D1758	8-719-074-25	DIODE	PG104R
		IC	
IC1707	8-759-356-16	IC	NJM4556AD
IC1751	8-759-562-43	IC	TDA6108JF/N1B
		JACK	
⚠ J1751	1-451-544-11	SOCKET, CRT	
		CHIP CONDUCTOR	
JR710	1-216-864-11	SHORT CHIP	
		COIL	
L901	1-408-615-31	INDUCTOR	100µH
L1751	1-408-613-31	INDUCTOR	68µH
		TRANSISTOR	
Q761	8-729-422-27	TRANSISTOR	2SD601A-Q
Q762	8-729-422-27	TRANSISTOR	2SD601A-Q
Q763	8-729-422-27	TRANSISTOR	2SD601A-Q
Q771	8-729-422-27	TRANSISTOR	2SD601A-Q
Q772	8-729-422-27	TRANSISTOR	2SD601A-Q
Q773	8-729-422-27	TRANSISTOR	2SD601A-Q
Q781	8-729-422-27	TRANSISTOR	2SD601A-Q
Q782	8-729-422-27	TRANSISTOR	2SD601A-Q

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CV

REF. NO.	PART NO.	DESCRIPTION	VALUES		
Q783	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q901	8-729-053-87	TRANSISTOR	KTC4370A		
Q902	6-550-247-01	TRANSISTOR	KTA1659A		
Q903	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q904	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q905	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX		
Q906	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q1772	8-729-422-27	TRANSISTOR	2SD601A-Q		
	RESISTOR				
R760	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R762	1-218-692-11	METAL CHIP	1K	0.50%	1/10W
R763	1-216-835-11	METAL CHIP	15K	5%	1/10W
R764	1-218-678-11	METAL CHIP	270	0.50%	1/10W
R765	1-218-700-11	METAL CHIP	2.2K	0.50%	1/10W
R766	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R767	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R768	1-216-821-11	METAL CHIP	1K	5%	1/10W
R770	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R772	1-218-692-11	METAL CHIP	1K	0.50%	1/10W
R773	1-216-835-11	METAL CHIP	15K	5%	1/10W
R774	1-218-678-11	METAL CHIP	270	0.50%	1/10W
R775	1-218-700-11	METAL CHIP	2.2K	0.50%	1/10W
R776	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R777	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R778	1-216-821-11	METAL CHIP	1K	5%	1/10W
R780	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R782	1-218-692-11	METAL CHIP	1K	0.50%	1/10W
R783	1-216-835-11	METAL CHIP	15K	5%	1/10W
R784	1-218-678-11	METAL CHIP	270	0.50%	1/10W
R785	1-218-700-11	METAL CHIP	2.2K	0.50%	1/10W
R786	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R787	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R788	1-216-821-11	METAL CHIP	1K	5%	1/10W
R901	1-249-401-11	CARBON	47	5%	1/4W
R902	1-249-386-11	CARBON	2.7	5%	1/4W
R903	1-249-414-11	CARBON	560	5%	1/4W
R904	1-249-432-11	CARBON	18K	5%	1/4W
R905	1-249-417-11	CARBON	1K	5%	1/4W
R906	1-249-432-11	CARBON	18K	5%	1/4W
R907	1-249-386-11	CARBON	2.7	5%	1/4W
R908	1-249-414-11	CARBON	560	5%	1/4W
R909	1-260-312-11	CARBON	47	5%	1/2W
R910	1-216-476-11	METAL OXIDE	180	5%	3W

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R911	1-216-799-11	METAL CHIP	15	5%	1/10W
R912	1-216-813-11	METAL CHIP	220	5%	1/10W
R913	1-216-799-11	METAL CHIP	15	5%	1/10W
R914	1-216-814-11	METAL CHIP	270	5%	1/10W
R915	1-216-821-11	METAL CHIP	1K	5%	1/10W
R916	1-216-821-11	METAL CHIP	1K	5%	1/10W
R917	1-216-821-11	METAL CHIP	1K	5%	1/10W
R918	1-216-809-11	METAL CHIP	100	5%	1/10W
R919	1-216-809-11	METAL CHIP	100	5%	1/10W
R920	1-216-820-11	METAL CHIP	820	5%	1/10W
R921	1-216-833-11	METAL CHIP	10K	5%	1/10W
R922	1-249-397-11	CARBON	22	5%	1/4W
R923	1-249-401-11	CARBON	47	5%	1/4W
R1756	1-260-328-11	CARBON	1K	5%	1/2W
R1757	1-260-328-11	CARBON	1K	5%	1/2W
R1758	1-260-328-11	CARBON	1K	5%	1/2W
R1760	1-260-123-11	CARBON	100K	5%	1/2W
R1761	1-216-373-11	METAL OXIDE	2.2	5%	2W
R1761	1-216-395-00	METAL OXIDE	3.3	5%	3W
(KV-20FS120/21FA310LN/21FA310LS/21FM120/21FS120LN/21FS120LS ONLY)					
R1761	1-216-373-11	METAL OXIDE	2.2		2W
(KV-24FS120/25FS120LN/25FS120LS ONLY)					
R1762	1-216-375-00	METAL OXIDE	3.3	5%	2W
(KV-24FS120/25FS120LN/25FS120LS ONLY)					
R1763	1-247-807-31	CARBON	100	5%	1/4W
R1764	1-247-807-31	CARBON	100	5%	1/4W
R1765	1-247-807-31	CARBON	100	5%	1/4W
R1766	1-247-807-31	CARBON	100	5%	1/4W
R1767	1-247-807-31	CARBON	100	5%	1/4W
R1768	1-247-807-31	CARBON	100	5%	1/4W
R1770	1-260-132-11	CARBON	560K	5%	1/2W
R1778	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1779	1-247-791-91	CARBON	22	5%	1/4W
(KV-24FS120/25FS120LN/25FS120LS ONLY)					
R1780	1-216-837-11	METAL CHIP	22K	5%	1/10W
R1781	1-216-838-11	METAL CHIP	27K	5%	1/10W
R1785	1-249-399-11	CARBON	33	5%	1/4W
R1787	1-216-837-11	METAL CHIP	22K	5%	1/10W
R1788	1-249-421-11	CARBON	2.2K	5%	1/4W
R1789	1-249-425-11	CARBON	4.7K	5%	1/4W
	VARIABLE RESISTOR				
RV1701	1-238-019-11	RES, ADJ, METAL FILM	47K		
⚠ RV1750	1-241-656-11	RES, ADJ, METAL FILM	110M		

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K

REF. NO.	PART NO.	DESCRIPTION	VALUES		
*	**A-1410-921-A**	**K BOARD, MOUNTED**			
	(KV-21FA310 only)				
	4-382-854-11	SCREW (M3X10), P, SW (+)			
	CAPACITOR				
C2401	1-130-495-00	MYLAR	0.1µF	5%	50V
C2402	1-130-495-00	MYLAR	0.1µF	5%	50V
C2403	1-126-964-11	ELECT	10µF	20%	50V
C2404	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2405	1-126-965-91	ELECT	22µF	20%	50V
C2406	1-126-964-11	ELECT	10µF	20%	50V
C2407	1-126-964-11	ELECT	10µF	20%	50V
C2408	1-162-969-11	CERAMIC CHIP	0.0068µF	10%	25V
C2410	1-126-969-11	ELECT	220µF	20%	50V
C2411	1-126-965-91	ELECT	22µF	20%	50V
C2412	1-137-194-81	FILM	0.47µF	5%	50V
C2413	1-100-120-51	ELECT	1000µF	20%	35V
C2414	1-126-963-11	ELECT	4.7µF	20%	50V
C2415	1-126-967-11	ELECT	47µF	20%	50V
C2416	1-164-172-11	CERAMIC CHIP	0.0056µF	10%	25V
C2417	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2418	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C2419	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C2420	1-126-959-11	ELECT	0.47µF	20%	50V
C2421	1-126-959-11	ELECT	0.47µF	20%	50V
C2422	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C2423	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C2424	1-162-969-11	CERAMIC CHIP	0.0068µF	10%	25V
C2425	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2426	1-162-927-11	CERAMIC CHIP	100pF	5%	50V
C2427	1-126-947-11	ELECT	47µF	20%	35V
C2428	1-126-943-11	ELECT	2200µF	20%	25V
C2429	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2430	1-126-960-11	ELECT	1µF	20%	50V
C2431	1-126-963-11	ELECT	4.7µF	20%	50V
C2432	1-126-963-11	ELECT	4.7µF	20%	50V
C2433	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C2434	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2435	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2436	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V

REF. NO.	PART NO.	DESCRIPTION	VALUES		
C2437	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2438	1-164-227-11	CERAMIC CHIP	0.022µF	10%	25V
C2439	1-164-227-11	CERAMIC CHIP	0.022µF	10%	25V
C2440	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2441	1-115-412-11	CERAMIC CHIP	680pF	5%	25V
C2442	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C2443	1-115-412-11	CERAMIC CHIP	680pF	5%	25V
C2444	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C2445	1-126-965-91	ELECT	22µF	20%	50V
C2446	1-130-495-00	MYLAR	0.1µF	5%	50V
C2447	1-130-495-00	MYLAR	0.1µF	5%	50V
C2448	1-137-190-91	FILM	0.22µF	5%	50V
C2449	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C2450	1-126-963-11	ELECT	4.7µF	20%	50V
C2451	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
C2452	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V
C2453	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2454	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2455	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2456	1-126-963-11	ELECT	4.7µF	20%	50V
C2457	1-126-963-11	ELECT	4.7µF	20%	50V
C2458	1-126-963-11	ELECT	4.7µF	20%	50V
C2459	1-126-965-91	ELECT	22µF	20%	50V
C2460	1-137-194-81	FILM	0.47µF	5%	50V
C2461	1-126-963-11	ELECT	4.7µF	20%	50V
C2462	1-126-963-11	ELECT	4.7µF	20%	50V
C2463	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2464	1-126-960-11	ELECT	1µF	20%	50V
C2465	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2466	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2467	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V
C2468	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
C2469	1-130-495-00	MYLAR	0.1µF	5%	50V
C2470	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2471	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2472	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C2473	1-126-964-11	ELECT	10µF	20%	50V
C2474	1-126-964-11	ELECT	10µF	20%	50V
C2475	1-126-968-11	ELECT	100µF	20%	50V
C2476	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C2477	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2478	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2479	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2480	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
C2481	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2482	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2484	1-130-495-00	MYLAR	0.1µF	5%	50V
C2485	1-130-495-00	MYLAR	0.1µF	5%	50V
C2486	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C2487	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C2488	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2489	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C2490	1-104-665-11	ELECT	100µF	20%	25V
C2493	1-126-935-11	ELECT	470µF	20%	16V
C2494	1-126-935-11	ELECT	470µF	20%	16V
C2495	1-126-935-11	ELECT	470µF	20%	16V
C2496	1-126-935-11	ELECT	470µF	20%	16V
C2499	1-164-315-11	CERAMIC CHIP	470pF	5%	50V

CONNECTOR

* CN2401	1-564-510-11	PLUG, CONNECTOR	7P	
* CN2402	1-564-508-11	PLUG, CONNECTOR	5P	

DIODE

D2400	8-719-404-50	DIODE	MA111-TX
D2401	8-719-070-60	DIODE	PDZ7.5B-115

IC

IC2401	6-705-054-01	IC	TDA8947J
IC2402	8-759-100-96	IC	UPC4558G2
IC2403	6-706-034-01	IC	NJW1164M-TE2
IC2404	8-759-165-01	IC	NJM2177AFG1
IC2405	8-759-686-15	IC	NJM2180M (TE2)

CHIP CONDUCTOR

JR2401	1-216-864-11	SHORT CHIP
JR2402	1-216-864-11	SHORT CHIP
JR2410	1-216-864-11	SHORT CHIP
JR2411	1-216-864-11	SHORT CHIP
JR2420	1-216-864-11	SHORT CHIP
JR2421	1-216-864-11	SHORT CHIP

IC LINK

PS2401	1-576-337-21	IC LINK	2.7A	50V

REF. NO.	PART NO.	DESCRIPTION	VALUES

TRANSISTOR

Q2400	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q2401	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q2410	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q2411	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q2412	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q2413	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q2414	8-729-422-27	TRANSISTOR	2SD601A-Q
Q2418	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q2419	8-729-120-28	TRANSISTOR	2SC1623-L5L6

RESISTOR

R2401	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2402	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2403	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R2404	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2405	1-218-895-11	METAL CHIP	100K	0.50%	1/10W
R2406	1-218-714-11	METAL CHIP	8.2K	0.50%	1/10W
R2407	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2408	1-218-868-11	METAL CHIP	7.5K	0.50%	1/10W
R2409	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2410	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2411	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2412	1-218-868-11	METAL CHIP	7.5K	0.50%	1/10W
R2413	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2414	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2415	1-220-397-11	METAL CHIP	4.7M	5%	1/10W
R2416	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2417	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2418	1-216-809-11	METAL CHIP	100	5%	1/10W
R2419	1-216-809-11	METAL CHIP	100	5%	1/10W
R2420	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2421	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2422	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2423	1-216-840-11	METAL CHIP	39K	5%	1/10W
R2424	1-216-840-11	METAL CHIP	39K	5%	1/10W
R2425	1-216-840-11	METAL CHIP	39K	5%	1/10W
R2426	1-216-817-11	METAL CHIP	470	5%	1/10W
R2427	1-216-817-11	METAL CHIP	470	5%	1/10W
R2428	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R2429	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R2430	1-216-809-11	METAL CHIP	100	5%	1/10W

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
R2431	1-216-809-11	METAL CHIP	100	5%	1/10W
R2432	1-216-864-11	SHORT CHIP			
R2433	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2434	1-218-895-11	METAL CHIP	100K	0.50%	1/10W
R2435	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2436	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2437	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2438	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2439	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2440	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2441	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2442	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2443	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2446	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2447	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2448	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2449	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2450	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2451	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2452	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2453	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2454	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2455	1-216-809-11	METAL CHIP	100	5%	1/10W
R2456	1-216-809-11	METAL CHIP	100	5%	1/10W
R2457	1-216-864-11	SHORT CHIP			
R2458	1-216-861-11	METAL CHIP	2.2M	5%	1/10W
R2459	1-216-853-11	METAL CHIP	470K	5%	1/10W
R2460	1-218-714-11	METAL CHIP	8.2K	0.50%	1/10W
R2461	1-216-839-11	METAL CHIP	33K	5%	1/10W
R2462	1-218-296-11	METAL CHIP	75K	5%	1/10W
R2463	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R2464	1-218-331-11	METAL CHIP	51K	5%	1/10W
R2465	1-216-824-11	METAL CHIP	1.8K	5%	1/10W
R2466	1-218-866-11	METAL CHIP	6.2K	0.50%	1/10W
R2467	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2468	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2469	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2470	1-216-840-11	METAL CHIP	39K	5%	1/10W
R2471	1-216-824-11	METAL CHIP	1.8K	5%	1/10W
R2472	1-218-331-11	METAL CHIP	51K	5%	1/10W
R2473	1-216-861-11	METAL CHIP	2.2M	5%	1/10W
R2474	1-216-839-11	METAL CHIP	33K	5%	1/10W
R2475	1-218-296-11	METAL CHIP	75K	5%	1/10W
R2476	1-216-835-11	METAL CHIP	15K	5%	1/10W

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R2477	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2478	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2479	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2480	1-218-331-11	METAL CHIP	51K	5%	1/10W
R2481	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R2482	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2483	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2484	1-216-828-11	METAL CHIP	3.9K	5%	1/10W
R2485	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2486	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2487	1-218-717-11	METAL CHIP	11K	0.50%	1/10W
R2488	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R2489	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2490	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2491	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2492	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2493	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2494	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2495	1-218-292-11	METAL CHIP	20K	5%	1/10W
R2496	1-216-847-11	METAL CHIP	150K	5%	1/10W
R2497	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R2498	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2499	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2500	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R2501	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2502	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2503	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2504	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2505	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2507	1-216-809-11	METAL CHIP	100	5%	1/10W
R2519	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2520	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2521	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2522	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2523	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2524	1-216-864-11	SHORT CHIP			

HR HB

REF. NO.	PART NO.	DESCRIPTION	VALUES		
HR					
*	**A-1415-629-A**	**HR (VAR) BOARD, MOUNTED** (KV-21FA310 only)			
		CAPACITOR			
	C3001	1-104-665-11	ELECT	100µF	20% 25V
		CONNECTOR			
*	CN3001	1-564-521-11	PLUG, CONNECTOR	6P	
		DIODE			
	D3001	8-719-109-89	DIODE	RD5.6ESB2	
	D3002	8-719-057-09	DIODE	LNJ801LPDJA	
		IC			
	IC3001	8-742-211-20	HYB IC	SBX3071-71	
		RESISTOR			
	R3001	1-249-417-11	CARBON	1K	5% 1/4W
	R3014	1-247-807-31	CARBON	100	5% 1/4W
		SWITCH			
	S3006	1-786-338-12	SWITCH, TACTILE		
HB					
*	**A-1415-580-A**	**HB (VAR) BOARD, MOUNTED** (ALL EXCEPT KV-21FA310LN/21FA310LS/21FM120)			
*	**A-1415-692-A**	**HB (VAR) BOARD, MOUNTED** (KV-21FM120 ONLY)			
		CAPACITOR			
	C2001	1-104-665-11	ELECT	100µF	20% 25V
	C2234	1-126-960-11	ELECT	1µF	20% 50V
	C2235	1-126-960-11	ELECT	1µF	20% 50V
	C2401	1-126-965-91	ELECT	22µF	20% 50V
	C2402	1-126-965-91	ELECT	22µF	20% 50V

REF. NO.	PART NO.	DESCRIPTION	VALUES		
		CONNECTOR			
*	CN2402	1-564-507-11	PLUG, CONNECTOR	4P	
		DIODE			
	D2001	8-719-109-89	DIODE	RD5.6ESB2	
	D2002	8-719-070-80	DIODE	LNK0120022G	
	D2003	8-719-109-89	DIODE	RD5.6ESB2	
	D2004	8-719-109-89	DIODE	RD5.6ESB2	
	D2005	8-719-109-89	DIODE	RD5.6ESB2	
	D2233	8-719-108-12	DIODE	RD9.1EW	
	D2235	8-719-108-12	DIODE	RD9.1EW	
	D2236	8-719-108-12	DIODE	RD9.1EW	
		FERRITE BEAD			
	FB2001	1-410-397-21	FERRITE	1.1µH	
	FB2002	1-410-397-21	FERRITE	1.1µH	
	FB2003	1-410-397-21	FERRITE	1.1µH	
	FB2004	1-410-397-21	FERRITE	1.1µH	
		IC			
	IC2001	8-742-212-20	HYB IC	SBX3081-71	
		JACK			
	J2231	1-794-048-11	JACK, PIN	3P (ALL EXCEPT KV-21FA310LN/21FA310LS/21FM120)	
	J2231	1-580-441-41	JACK, PIN	2P (KV-21FM120 ONLY)	
	J2401	1-568-267-21	JACK		
		RESISTOR			
	R2004	1-249-417-11	CARBON	1K	5% 1/4W
	R2007	1-247-807-31	CARBON	100	5% 1/4W
	R2008	1-249-427-11	CARBON	6.8K	5% 1/4W
	R2009	1-249-421-11	CARBON	2.2K	5% 1/4W
	R2010	1-249-416-11	CARBON	820	5% 1/4W
	R2011	1-249-415-11	CARBON	680	5% 1/4W
	R2201	1-249-419-11	CARBON	1.5K	5% 1/4W
	R2202	1-249-421-11	CARBON	2.2K	5% 1/4W
	R2203	1-249-427-11	CARBON	6.8K	5% 1/4W
	R2234	1-247-804-11	CARBON	75	5% 1/4W

HB

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R2235	1-249-409-11	CARBON	220	5%	1/4W
R2236	1-249-441-11	CARBON	100K	5%	1/4W
R2237	1-249-409-11	CARBON	220	5%	1/4W
R2238	1-249-441-11	CARBON	100K	5%	1/4W
R2401	1-249-413-11	CARBON	470	5%	1/4W
R2402	1-249-413-11	CARBON	470	5%	1/4W

SWITCH

S2001	1-692-431-21	SWITCH, TACTILE
S2002	1-692-431-21	SWITCH, TACTILE
S2003	1-692-431-21	SWITCH, TACTILE
S2004	1-692-431-21	SWITCH, TACTILE
S2005	1-692-431-21	SWITCH, TACTILE
S2006	1-692-431-21	SWITCH, TACTILE
S2007	1-762-816-11	SWITCH, TACTILE
S2008	1-762-816-11	SWITCH, TACTILE

ACCESSORIES AND PACKING

1-501-730-41 ANTENNA, TELESCOPIC
(ALL EXCEPT KV-20FS120/24FS120)

* 4-041-255-01 BAG, PROTE CTION
(KV-25FS120LN/25FS120LS ONLY)

* 4-041-255-23 BAG, PROTECTION
(KV-21FA310LN/21FA310LS/24FS120 ONLY)

* 4-073-838-01 BAG, PROTECTION
(KV-20FS120/21FM120/21FS120LN/21FS120LS ONLY)

* 4-102-064-01 CARTON, INDIVIDUAL
(KV-20FS120 ONLY)

* 4-102-067-01 CARTON, INDIVIDUAL
(KV-21FA310LN/21FA310LS ONLY)

4-102-070-01 CARTON, INDIVIDUAL
(KV-25FS120LN/25FS120LS ONLY)

* 4-102-538-01 CARTON, INDIVIDUAL
(KV-21FS120LN/21FS120LS ONLY)

* 4-102-539-01 CARTON, INDIVIDUAL
(KV-21FM120 ONLY)

* 4-103-302-01 CARTON, INDIVIDUAL
(KV-24FS120 ONLY)

REF. NO.	PART NO.	DESCRIPTION	VALUES

* 4-102-066-01 CUSHION, LOWER
(KV-20FS120/21FM120/21FS120LN/21FS120LS ONLY)

* 4-102-069-01 CUSHION, LOWER
(KV-21FA310LN/21FS310LS ONLY)

* 4-102-072-01 CUSHION, LOWER
(KV-24FS120/25FS120LN/25FS120LS ONLY)

* 4-102-065-01 CUSHION, UPPER
(KV-20FS120/21FM120/21FS120LN/21FS120LS ONLY)

* 4-102-068-01 CUSHION, UPPER
(KV-21FA310LN/21FA310LS ONLY)

* 4-102-071-01 CUSHION, UPPER
(KV-24FS120/25FS120LN/25FS120LS ONLY)

4-101-451-41 MANUAL, INSTRUCTION
(KV-21FA310LN/21FA310LS ONLY)

4-101-452-21 MANUAL, INSTRUCTION
(KV-20FS120 ONLY)

4-101-452-31 MANUAL, INSTRUCTION
(KV-20FS120 CANADA ONLY)

4-101-452-41 MANUAL, INSTRUCTION
(KV-21FM120/21FS120LN/21FS120LS/25FS120LN/25FS120LS ONLY)

4-101-454-21 MANUAL, INSTRUCTION
(KV-24FS120 ONLY)

4-101-455-31 MANUAL, INSTRUCTION
(KV-24FS120 CANADA ONLY)

1-417-182-11 MATCHING TRANSFORMER, ANTENNA
(ALL EXCEPT KV-20FS120/24FS120)

REMOTE COMMANDER

1-477-846-11 REMOTE COMMANDER (RM-W151)

(NOT AVAILABLE) BATTERY COVER (for RM-W151)
(KV-21FM120 ONLY)

1-476-680-12 REMOTE COMMANDER (RM-Y180)

4-978-977-11 BATTERY COVER (for RM-Y180)
(KV-21FA310LS/21FA310LN ONLY)

1-468-835-11 REMOTE COMMANDER (RM-Y194)

(NOT AVAILABLE) BATTERY COVER (for RM-Y194)
(ALL EXCEPT KV-21FM120/21FA310LS/21FA310LN)

Sony Corporation
Sony Technology Center
Technical Services
Service Promotion Department

English
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SERVICE MANUAL

BA-6 CHASSIS

In an effort to reduce the size of this pdf file the tiled schematics are not attached to this Service Manual. To receive a complete set of the tiled schematics for this manual please submit a request to Nita Wardlaw at nita.wardlaw@am.sony.com.

SONY

4-101-452-**21**

FD Trinitron

WEGA®

Operating Instructions

KV-20FS120
KV-24FS120

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WARNING

To reduce the risk of fire or electric shock, do not expose the TV to rain or moisture.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Note to the CATV Installer

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

SAFETY PRECAUTIONS

- ❏ Operate the TV only on 120 V AC.
- ❏ One blade of the power plug is wider than the other for safety purposes and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.
- ❏ If any liquid or solid object falls into the TV, unplug it and have it checked by qualified personnel before operating it further.

CAUTION

When using TV games, computers, and similar products with your TV, keep the brightness and contrast functions at low settings. If a fixed (non-moving) pattern is left on the screen for long periods of time at a high brightness or contrast setting, the image can be permanently imprinted onto the screen. Continuously watching the same channel can cause the imprint of station logos onto the TV screen. These types of imprints are not covered by your warranty because they are the results of misuse.

To reduce the risk of electric shock, do not use this polarized plug with an extension cord, receptacle, or other outlet unless the blades can be fully inserted to prevent blade exposure.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

NOTIFICATION

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference with radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ❏ Reorient or relocate the receiving antennas.
- ❏ Increase the separation between the equipment and receiver.
- ❏ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ❏ Consult the dealer or an experienced radio/TV technician for help.

Protecting the TV

- ❏ To prevent internal heat build-up, do not block the ventilation openings.
- ❏ Do not install the TV in a hot or humid place, or in a place subject to excessive dust or mechanical vibration.

Note on Caption Vision

This television receiver provides display of television closed captioning in accordance with § 15.119 of the FCC rules. Use of this television for other than private viewing of programs broadcast on UHF or VHF or transmitted by cable companies for the use of the general public may require authorization from the broadcaster-cable company and/or program owner.

Owner's Record

The model and serial numbers are located on the front cover of this manual and at the rear of your TV.

Trademarks and Copyrights

ENERGY STAR® is a registered mark.

As an ENERGY STAR® Partner, Sony has determined that this product or product model meets the ENERGY STAR® guidelines for energy efficiency.

WEGA®, FD Trinitron, Caption Vision and Steady Sound are registered trademarks of Sony Corporation.

IMPORTANT SAFEGUARDS

For your protection, please read these instructions completely, and keep this manual for future reference. Carefully observe and comply with all warnings, cautions and instructions placed on the set, or described in the operating instructions or service manual.

WARNING

To guard against injury, the following basic safety precautions should be observed in the installation, use, and servicing of the set.

Use

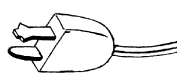
Power Sources

This set should be operated only from the type of power source indicated on the serial/model plate. If you are not sure of the type of electrical power supplied to your home, consult your dealer or local power company. For those sets designed to operate from battery power, refer to the operating instructions.

Grounding or Polarization

This set may be equipped with a polarized alternating current line plug (a plug having one blade wider than other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

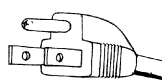
For the set with a polarized AC power cord plug



This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to have a suitable outlet installed. Do not defeat the safety purpose of the polarized plug by forcing it in.

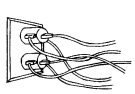
Alternate Warning

For the set with a three-wire grounding type AC plug



This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to have a suitable outlet installed. Do not defeat the safety purpose of the grounding plug.

Overloading



Do not overload wall outlets, extension cords or convenience receptacles beyond their capacity, since this can result in fire or electric shock.
Always turn the set off when it is not to be used. When the set is left unattended and unused for long periods of time, unplug it from the wall outlet as a precaution against the possibility of an internal malfunction that could create a fire hazard.
Do not disconnect the antenna or the power cord during a heavy storm. Lightning may strike while you are holding the cable or cord, causing serious injury. Turn off your TV and wait for the weather to improve.

Object and Liquid Entry

Never push objects of any kind into the set through the cabinet slots as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the set.

Attachments

Do not use attachments not recommended by the manufacturer, as they may cause hazards.
Do not place any objects, especially heavy objects, on top of the set. The object may fall from the set, causing injury.

Cleaning

Unplug the set from the wall outlet before cleaning or polishing it. Do not use liquid cleaners or aerosol cleaners. Use a cloth lightly dampened with water for cleaning the exterior of the set.

If a snapping or popping sound from a TV set is continuous or frequent while the TV is operating, unplug the TV and consult your dealer or service technician. It is normal for some TV sets to make occasional snapping or popping sounds, particularly when being turned on or off.

Installation

Always use two or more people to lift or move the set. The set is heavy and the bottom surface is flat. Serious injury can result from trying to move the set by yourself alone, or from unsteady handling.
Install the set on a stable, level surface.

Water and Moisture

Do not use power-line operated sets near water — for example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, etc.

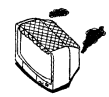
Accessories

Do not place the set on an unstable cart, stand, tripod, bracket, table, or shelf. The set may fall, causing serious injury to a child or an adult, and serious damage to the set.
Use only a cart or stand recommended by the manufacturer for the specific model of TV. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

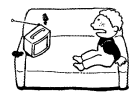
Ventilation

The slots and openings in the cabinet and in the back or bottom are provided for necessary ventilation. To ensure reliable operation of the set, and to protect it from overheating, these slots and openings must never be blocked or covered.

- **Never cover the slots and openings with a cloth or other materials.**



- **Never block the slots and openings by placing the set on a bed, sofa, rug or other similar surface.**



- **Never place the set in a confined space, such as a bookcase or built-in cabinet, unless proper ventilation is provided.**

- **Do not place the set near or over a radiator or heat register, or where it is exposed to direct sunlight.**

Power-Cord Protection

Do not allow anything to rest on or roll over the power cord, and do not place the set where the power cord is subject to wear or abuse.

Antennas

Outdoor Antenna Grounding

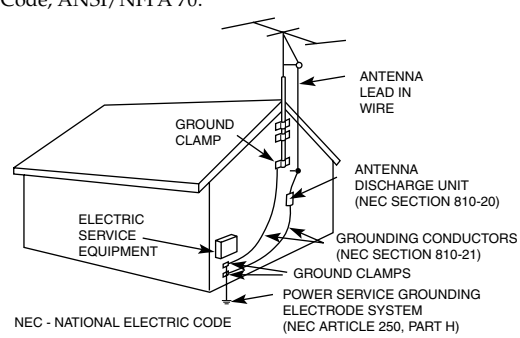
If an outdoor antenna is installed, follow the precautions below. An outdoor antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can come in contact with such power lines or circuits.

WHEN INSTALLING AN OUTDOOR ANTENNA SYSTEM, EXTREME CARE SHOULD BE TAKEN TO KEEP FROM CONTACTING SUCH POWER LINES OR CIRCUITS AS CONTACT WITH THEM IS ALMOST INVARIABLY FATAL.

Be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code (NEC) in USA and Section 54 of the Canadian Electrical Code in Canada provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

Antenna Grounding According to the NEC

Antenna Grounding According to the National Electrical Code, ANSI/NFPA 70.


ANTENNA LEAD IN WIRE
GROUND CLAMP
ANTENNA DISCHARGE UNIT (NEC SECTION 810-20)
ELECTRIC SERVICE EQUIPMENT
GROUNDING CONDUCTORS (NEC SECTION 810-21)
GROUND CLAMPS
POWER SERVICE GROUNDING ELECTRODE SYSTEM (NEC ARTICLE 250, PART H)
NEC - NATIONAL ELECTRIC CODE

Lightning

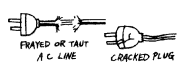
For added protection for this television receiver during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna. This will prevent damage to the receiver due to lightning and power-line surges.

Service

Damage Requiring Service

Unplug the set from the wall outlet and refer servicing to qualified service personnel under the following conditions:

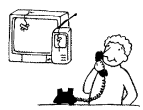
- **When the power cord or plug is damaged or frayed.**



- **If liquid has been spilled into the set or objects have fallen into the product.**

- **If the set has been exposed to rain or water.**

- **If the set has been subject to excessive shock by being dropped, or the cabinet has been damaged.**



- **If the set does not operate normally when following the operating instructions. Adjust only those controls that are specified in the operating instructions. Improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the set to normal operation.**

- **When the set exhibits a distinct change in performance — this indicates a need for service.**

Servicing

Do not attempt to service the set yourself since opening the cabinet may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

Replacement Parts

When replacement parts are required, be sure the service technician certifies in writing that he has used replacement parts specified by the manufacturer that have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazards.

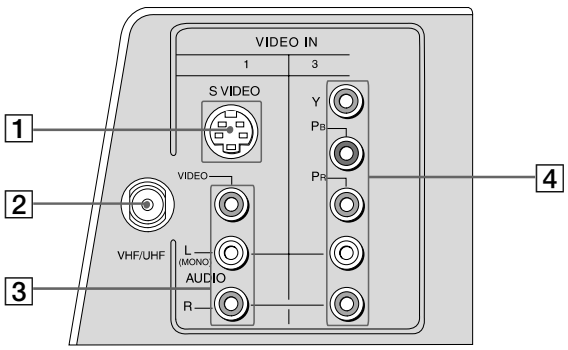
Safety Check

Upon completion of any service or repairs to the set, ask the service technician to perform routine safety checks (as specified by the manufacturer) to determine that the set is in safe operating condition, and to so certify. When the set reaches the end of its useful life, improper disposal could result in a picture tube implosion. Ask a qualified service technician to dispose of the set.

Connecting Your TV

Read this section before setting up your TV for the first time. This section covers basic connections in addition to any optional equipment you may be connecting.

TV Rear Panel



Jack	Description
1 **S VIDEO**	Connects to the S VIDEO OUT jack on your VCR or other video equipment that has S VIDEO. S VIDEO provides better picture quality than the VHF/UHF jacks or the video input jack. S VIDEO does not provide sound; the audio cables must still be connected.

✍ S-VIDEO is only for KV-24FS120.

2 **VHF/UHF**	Connects to your VHF/UHF antenna or cable.
3 **Video/Audio L(Mono),R**	Connects to the AUDIO and VIDEO output jacks on your VCR or other video equipment. A second video input jack (VIDEO 2) is located on the front panel of the TV. These AUDIO/VIDEO input jacks provide better picture quality than the VHF/UHF jack.
4 **Y, P_B, P_R/L, R**	Connects to the component video Y, P_B, P_R to AUDIO L and R output jacks on your DVD player or Digital Set-top box.

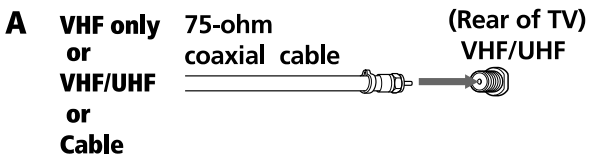
✍ The rear panels illustrated in this manual are for KV-24FS120. The real panels on your TV may not look exactly like those illustrated.

Basic Connections

TV with indoor or outdoor antenna, or CATV cable

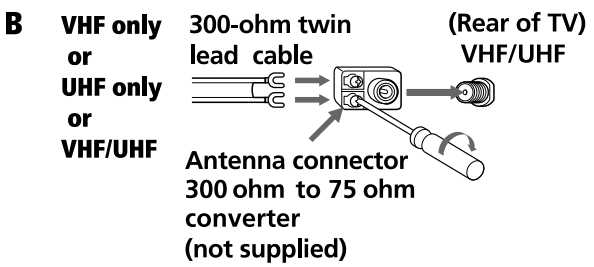
Depending on the cable available in your home, choose one of the connections below:

A



Use this to connect the TV to a cable system or an antenna with a 75-ohms cable (usually built into newer homes).

B

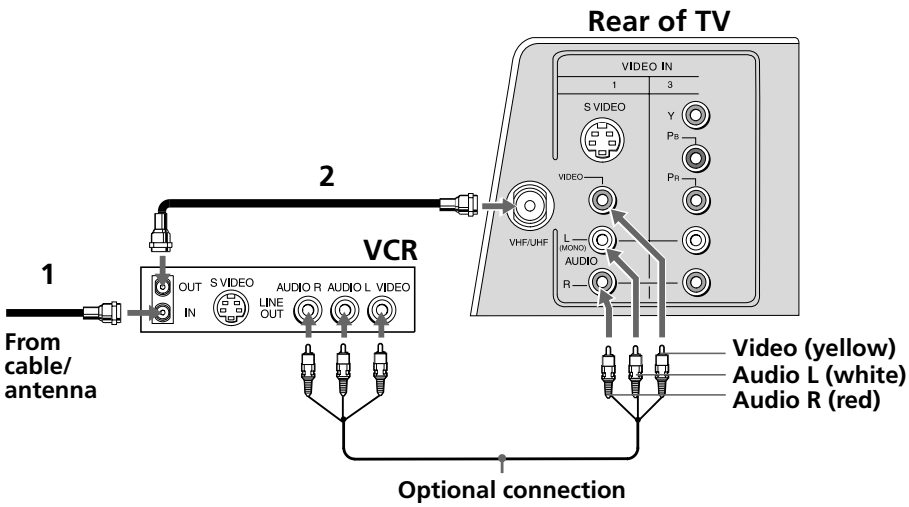


Use this to connect the TV to a dipole antenna, also known as "rabbit ears" antenna (usually found in to older homes).

✍ If you are connecting to an indoor or outdoor antenna, you may need to adjust the orientation of the antenna for best reception.

Connecting Additional Equipment

TV and VCR



✍ To watch video programs from your VCR, tune your TV to channel 3 or 4 (as set on the rear of your VCR).

1 Connect the coaxial cable from your TV antenna or cable service to the IN jack on your VCR.

2 Connect a coaxial cable (not supplied) from the OUT jack on your VCR to the VHF/UHF jack on the TV.

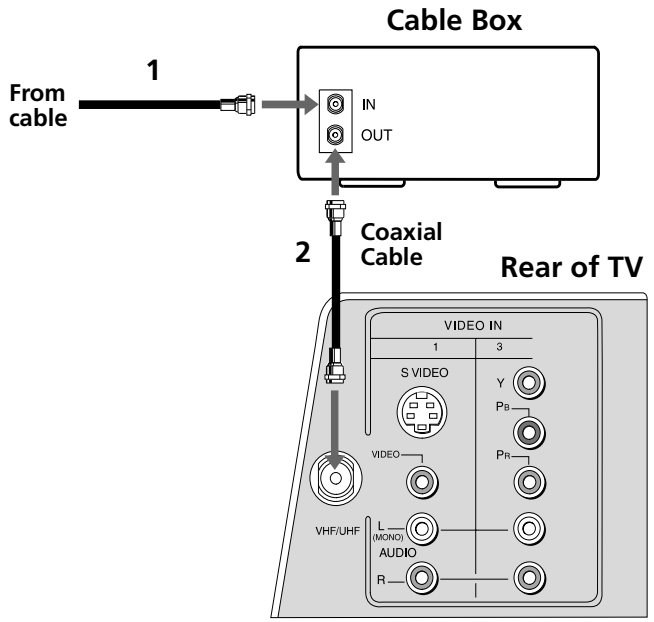
Optional connection

- ❏ If your VCR is equipped with video outputs, you can get better picture quality by connecting Audio/Video cables (not supplied) from AUDIO and VIDEO OUT on your VCR to AUDIO/VIDEO IN on your TV.
- ❏ For better picture quality, use S VIDEO instead of the yellow Audio/Video cable. S-VIDEO does not provide sound; the audio cables must still be connected.

✍ S-VIDEO is only for KV-24FS120 model.

✍ You can use the TV/VIDEO button to switch between the VHF/UHF and VIDEO inputs.

TV and Cable Box



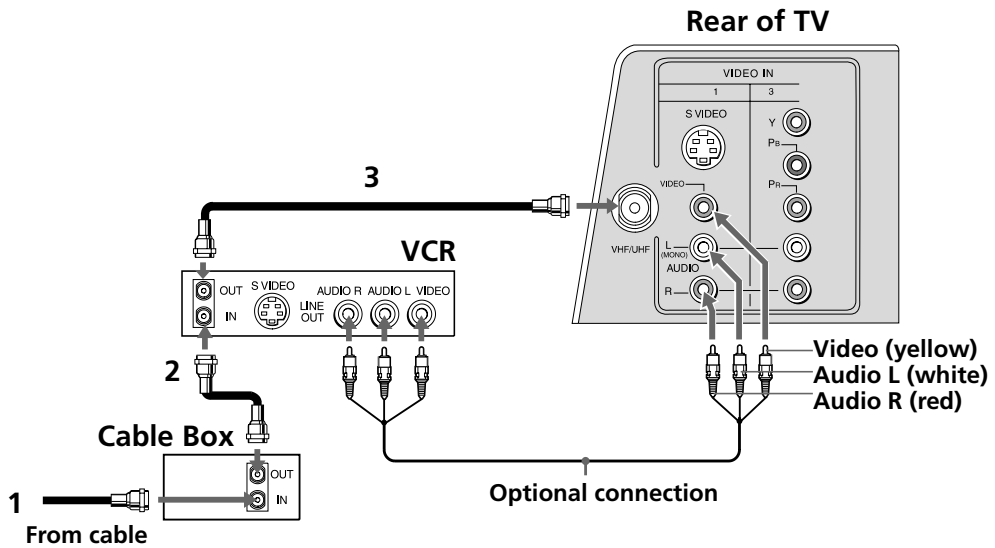
1 Connect the coaxial cable from your cable service to the IN jack on your cable box.

2 Connect a coaxial cable (not supplied) from the OUT jack on your cable box to the VHF/UHF jack on the TV.

Optional Connection

- ❏ To view channels from your cable box, tune your TV to channel 3 or 4 (as set on the rear panel of your cable box) and use the cable box's remote control to change channels.
- ❏ If you will be controlling all channel selection through your cable box, you should consider using the Channel Fix feature by setting your TV to channnel 3 or 4 (see page 22).

TV, VCR, and Cable Box



1 Connect the coaxial cable from your cable service to the IN jack on your cable box.

2 Connect a coaxial cable (not supplied) from the OUT jack on your cable box to the IN jack on your VCR.

3 Connect a coaxial cable (not supplied) from the OUT jack on your VCR to the VHF/UHF jack on the TV.

✍ If you will be controlling all channel selection through your cable box, you should consider using the Channel Fix feature by setting your TV to channel 3 or 4 (see page 22).

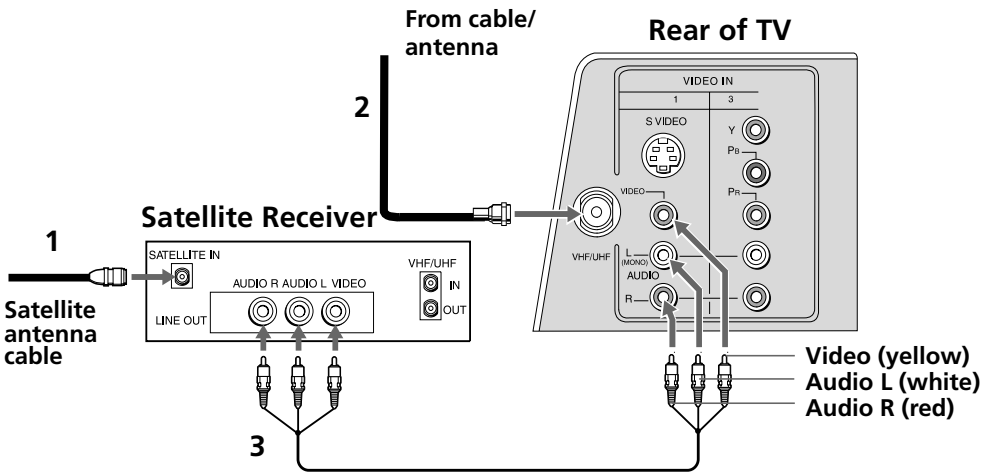
Optional connection

- ❏ If your VCR is equipped with video outputs, you can get better picture quality by connecting Audio/Video cables (not supplied) from Audio and Video OUT on your VCR to Audio/Video IN on your TV.
- ❏ For better picture quality, use S VIDEO instead of the yellow Audio/ Video cable. S-VIDEO does not provide sound; the audio cables must still be connected.

✍ S-VIDEO is only for KV-24FS120 model.

✍ You can use the TV/VIDEO button to switch between the VHF/UHF and VIDEO inputs.

TV and Satellite Receiver



1 Connect the cable from your satellite antenna to SATELLITE IN on your satellite receiver.

2 Connect the coaxial cable from your cable service or antenna to the VHF/UHF jack on your TV.

3 Using audio/video cables (not supplied), connect AUDIO and VIDEO OUT on your satellite receiver to AUDIO and VIDEO IN on your TV.

✍ To watch video programs from your Satellite receiver, tune your TV to channel 3 or 4.

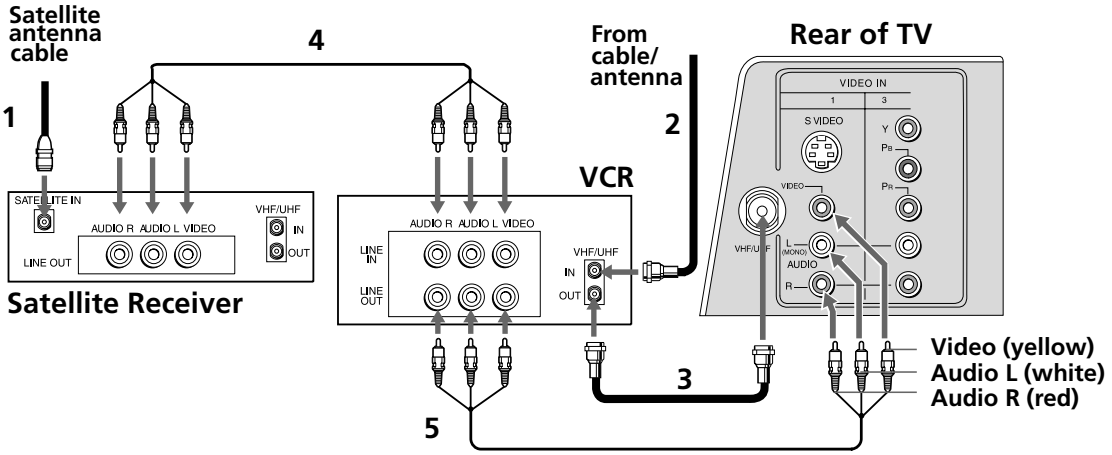
Optional Connection

❑ For better picture quality, use S VIDEO instead of the yellow audio/video cable. S-VIDEO does not provide sound; the audio cables must still be connected.

✍ S-VIDEO is only for KV-24FS120 model.

✍ You can use the TV/VIDEO button to switch between the VHF/UHF and VIDEO inputs.

TV, Satellite Receiver, and VCR



1 Connect the cable from your satellite antenna to SATELLITE IN on the satellite receiver.

2 Connect the coaxial cable from your cable service or antenna to the IN jack on your VCR.

3 Using a coaxial cable (not supplied), connect the OUT jack on your VCR to the VHF/UHF jack on your TV.

4 Using audio/video cables (not supplied), connect AUDIO and VIDEO OUT on your satellite receiver to AUDIO and VIDEO IN on your VCR.

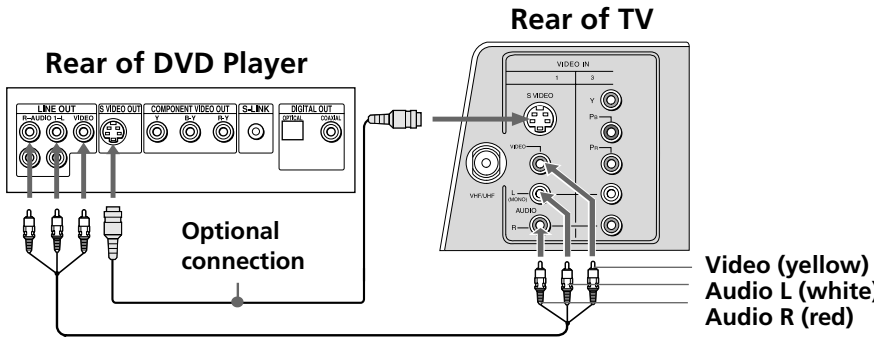
5 Using audio/video cables (not supplied), connect AUDIO and VIDEO OUT on your VCR to AUDIO and VIDEO IN on your TV.

Optional Connection

❑ To view from the satellite receiver or VCR, select the video input to which your satellite receiver or VCR is connected by pressing TV/VIDEO on the remote control.

Connecting a DVD Player using Composite Video (Video/Audio L(Mono), R)

Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on your DVD player to AUDIO/VIDEO IN on your TV.

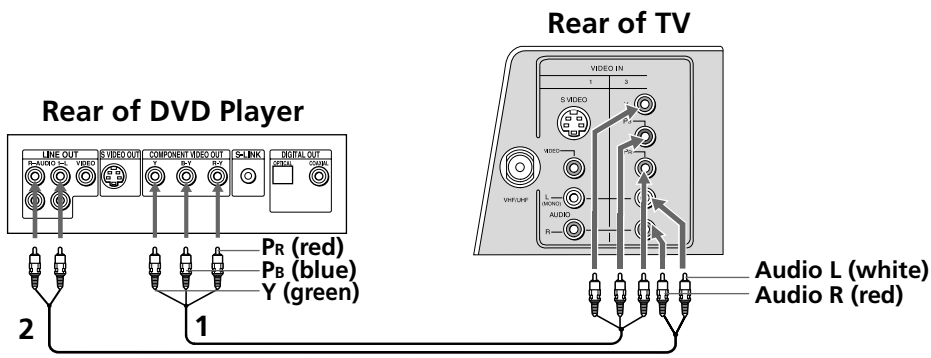


Optional connection

❏ For better picture quality, use S VIDEO instead of the yellow audio/video cable. S-VIDEO does not provide sound, so you still must connect the audio cables.

Connecting a DVD Player using Component Video (Y, P_B, P_R)

❏ If your DVD player is equipped with component video outputs (Y, P_B, P_R/L, R), you can improve the picture quality by using component video cables (480i only).



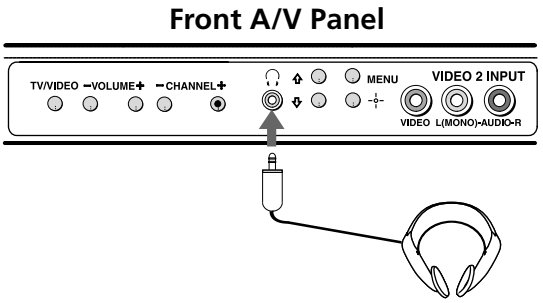
1 Using component video cables (not supplied), connect the Y, P_B, P_R OUT on your DVD player to Y, P_B, P_R IN on your TV.

2 Connect AUDIO OUT on your DVD player to AUDIO IN on your TV.

✍ The Y, P_B, P_R outputs on your DVD player are sometimes labeled Y, C_B, and C_R or Y, B-Y, and R-Y. If so, connect the cables to like colors.

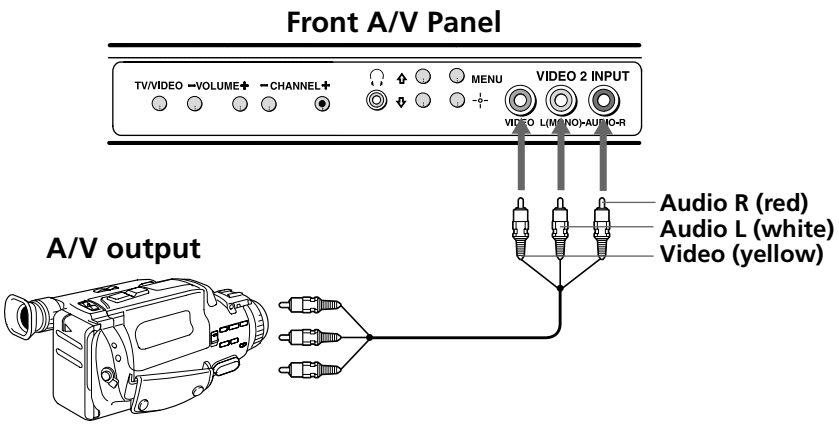
Connecting Headphones

Connect the headphones to the jack on the front of your TV. Headphone jack is STEREO.

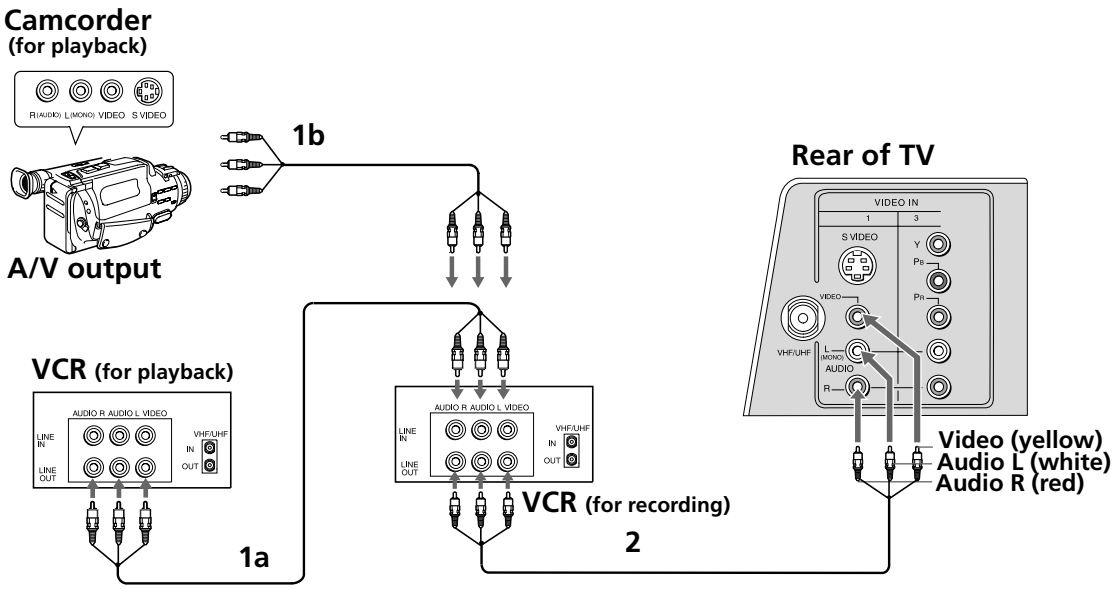


Connecting a Camcorder

Using audio/video cables (not supplied), connect AUDIO and VIDEO OUT on your camcorder to AUDIO and VIDEO IN on your TV.



Connecting for Video Tape Editing (VCR and Camcorder)



1 For video tape editing connect to the VCR the following sources (VCR or Camcorder):

a) Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on your first VCR to AUDIO/VIDEO IN on your second VCR

b) Using audio/video cables (not supplied), connect the AUDIO/VIDEO OUT on your Camcorder to the AUDIO/VIDEO IN on your second VCR

2 Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on the second VCR to the AUDIO/VIDEO IN on your TV.

Other Information

Troubleshooting

If you have a problem with your TV, try the suggestions below. If the problem persists, see "Contacting Sony" at the end of this section.

General

Problem	Possible Remedies
I want to reset the TV to the factory settings	❑ Turn on the TV. While holding down the RESET button on the remote control, press POWER button on the TV front panel. The TV will turn itself off, then back on again. Release the RESET button.
The TV is dirty	❑ Clean the TV with a soft dry cloth. Never use strong solvents such as thinner or benzine, which might damage the finish of the cabinet.
I lost the parental control password	❑ In the password screen, enter the following master password: 4357. After using the master password, you must create a new password. You cannot use the master to unlock currently blocked channels.
There is a black box on the screen	❑ You have selected a text option in the Setup menu (page 31) and no text is available. To turn off this feature, select Off in the Caption Vision option. If you were trying to select closed captioning, select CC1-4 instead of Text1-4.
There was a blackout or power outage, and now the TV won't turn on and the timer LED is flashing	❑ Press the POWER button on your remote control or on the TV front panel.
Digital cable box does not work	❑ Be sure that you have not connected the digital cable box to the TV's jack. This jack is not compatible with digital cable boxes. ❑ If you are connecting a VCR and digital cable box using a splitter, as described in pages 9, you must use a special bi-directional splitter that is designed to work with your digital cable box.

Remote Control

Problem	Possible Remedies
I cannot operate the remote control	❏ Check the orientation of the batteries. ❏ Batteries could be weak. Replace them (page 2). ❏ Move the TV three to four feet away from fluorescent lights.
I cannot change channels with the remote control	❏ Make sure you have not inadvertently switched your TV from the channel 3 or 4 setting if you are using another device to change channels.
I lost the remote control	❏ You can use the front panel controls to access your menus, change channels, adjust the volume, or change video inputs (page 2). Contact your nearest Sony Dealer to order a replacement, please call our Sony Direct Accessory and Part Center at 1-800-488-7669 (U.S. residents only).

Video

Problem	Possible Remedies
No picture, no sound	❏ Make sure the power cord is plugged in. ❏ If a red light is flashing on the front of your TV for more than a few minutes, disconnect and reconnect the power cord. If the problem continues, call your local service center. ❏ Check the TV/VIDEO setting: when watching TV, set it to TV; when watching video equipment, set it to VIDEO 1, 2 or 3 (page 3). ❏ Try another channel to rule out station trouble.
Poor or no picture, good sound	❏ Adjust the **Picture** setting in the Video menu (page 20). ❏ Adjust the **Brightness** setting in the Video menu (page 20). ❏ Check the antenna and/or cable connections (page 6).
No color	❏ Adjust the **Color** setting in the Video menu (page 20).
Only snow appears on the screen	❏ Check the **Cable** setting in the Channel menu (page 22). ❏ Check the antenna and/or cable connections (page 6). ❏ Make sure the channel selected is currently broadcasting.
Dotted lines or stripes	❏ Adjust the antenna. ❏ Move the TV away from other electronic equipment. Some electronic equipment creates electrical noise, which can interfere with TV reception.
Double images or ghosts	❏ Check your outdoor antenna or call your cable service.

Audio

Problem	Possible Remedies
Good picture, no sound	❏ Press MUTING so that Muting disappears from the screen (page 3). ❏ Check your Audio settings. Your TV may be set to Auto SAP in the MTS feature (page 21). ❏ Adjust your TV's volume.
Low or no audio (TV and Cable box)	❏ Some cables boxes have volume level controls. Check and see if your cable box or cable box remote has a volume control.

Channels

Problem	Possible Remedies
I cannot receive higher number channels (UHF) when using an antenna	❏ Make sure **Cable** is set to Off in the Channel menu (page 22). ❏ Perform Auto Program to add channels that are not presently in the memory (page 15).
Cable stations don't seem to work	❏ Make sure **Cable** is set to On in the Channel menu (page 22). ❏ Perform Auto Program to add channels that are not presently in the memory (page 15).

Contacting Sony

Before calling our Customer Information Services Center, reset the TV to factory settings (see page 23). Please have your TV serial number ready. The number is located on the rear of your TV and on the front cover of this manual.

Our Customer Information Services Center phone number is 1-800-222-SONY (7669) (US residents only) or 1-877-899-SONY (7669) (Canadian residents only).

SONY

4-101-452-**41**

FD Trinitron

WEGA®

Manual de Instrucciones

KV-21FM120
KV-21FS120
KV-25FS120

Lea este manual antes de operar el producto.

© 2004 por Corporación Sony

ADVERTENCIA

Para evitar el riesgo de incendio o descarga eléctrica, no exponga el televisor a la lluvia o humedad.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
ATTENTION
RISQUE DE CHOC ELECTRIQUE,
NE PAS OUVRIR
PRECAUCION
RIESGO DE CHOQUE ELECTRICO
NO ABRIR
PRECAUCION: PARA REDUCIR EL RIESGO DE DESCARGA ELECTRICA NO RETIRE LA CUBIERTA NI LA PARTE POSTERIOR DE ESTE APARATO.
NO CONTIENE PIEZAS QUE EL USUARIO PUEDA REPARAR. PARA SERVICIO ACUDA A PERSONAL ESPECIALIZADO.

Este símbolo señala al usuario la presencia de voltaje peligroso sin aislamiento en el interior del aparato de tal intensidad que podría presentar riesgo de descarga eléctrica.

Este símbolo indica al usuario que el manual que acompaña a este aparato contiene instrucciones importantes referentes a su funcionamiento y mantenimiento.

Nota para el instalador de CATV

Esta nota pretende llamar la atención del instalador del sistema CATV en relación con el artículo 820-40 de la NEC que proporciona las pautas para una adecuada conexión a tierra y, en particular, especifica que el cable de conexión a tierra debe estar conectado al sistema de toma de tierra del edificio lo más cerca posible de la entrada del cable.

PRECAUCIONES DE SEGURIDAD

- ❏ Utilice el televisor con ca (corriente alterna) como se menciona a continuación para todos los países excepto en donde se indique:
  ca 120 V 60 Hz
  ca 220 V 50/60 Hz (Chile, Perú, Bolivia)
- ❏ Una terminal del enchufe es más ancha que la otra para garantizar la seguridad y solo se podrá introducir en la toma de corriente de una manera (sólo los modelos con ca 120 V). Si no puede insertar completamente el enchufe en la toma, póngase en contacto con su proveedor.
- ❏ Si se introduce algún objeto sólido o líquido en el televisor, desconéctelo y haga que sea revisado por personal especializado antes de volver a utilizarlo.

PRECAUCION

PARA EVITAR DESCARGAS ELÉCTRICAS, INTRODUZCA EL ENCHUFE EN EL TOMACORRIENTE POR COMPLETO, CON EL CONTACTO ANCHO DEL ENCHUFE EN LA RANURA ANCHA DEL TOMACORRIENTE.

Al usar videojuegos, computadoras y productos similares con el televisor, mantenga los ajustes de brillo y contraste a un nivel moderado. Si una imagen inmóvil permanece en la pantalla durante un periodo prolongado con elevada intensidad de brillo o contraste, la imagen podría quedar grabada en la pantalla en forma permanente. Igualmente, ver continuamente el mismo canal de televisión podría dejar grabada en la pantalla el logotipo de la emisora. La garantía no cubre este tipo de anomalías, ya que se deben al mal uso del aparato.

Para reducir el riesgo de descarga eléctrica, no utilice el enchufe polarizado con un cable de extensión, un receptáculo ni otras tomas, a menos que las terminales estén bien insertadas y no queden expuestas.

Se advierte que cualquier cambio o modificación que no se apruebe de modo explícito en este manual podría anular su autorización para utilizar este equipo.

NOTIFICACION

Este aparato ha sido debidamente probado, comprobándose que cumple con los límites impuestos a dispositivos digitales Clase B de acuerdo con la Sección 15 de las normas de la FCC. Estos límites se establecieron para ofrecer protección razonable contra interferencias perjudiciales en las instalaciones residenciales. Este aparato genera, usa y puede emitir energía radioeléctrica. De no instalarse y utilizarse de acuerdo con las instrucciones correspondientes, podría producir interferencias perjudiciales en las radiocomunicaciones. No obstante, no puede garantizarse que no se produzcan estas interferencias en una instalación determinada. Si este aparato llega a interferir en la recepción de radio o televisión, lo que podrá comprobarse encendiendo y apagando el aparato, se recomienda al usuario intentar corregir la interferencia mediante una o más de las siguientes medidas:

- ❏ Reoriente o cambie de lugar las antenas receptoras.
- ❏ Aumente la distancia que separa este aparato del receptor afectado.
- ❏ Conecte el aparato en una toma de corriente de un circuito distinto al que esté conectado el receptor que está afectado.
- ❏ Consulte con el distribuidor o solicite los servicios de un técnico capacitado en radio y televisión.

Cualquier cambio o modificación que no se detalla expresamente en el presente manual podría invalidar su autorización para emplear este aparato.

Protección del televisor

- ❏ Para evitar el sobrecalentamiento interno, no obstruya los orificios de ventilación.
- ❏ No instale el televisor en un lugar con temperatura elevada, humedad, exceso de polvo o donde puedan producirse vibraciones.

Nota sobre Caption Vision

Este receptor de televisión proporciona pantalla de televisión con visualización de subtítulos de acuerdo con el punto § 15.119 del reglamento de la FCC.

El uso del televisor con finalidades distintas a la visualización privada de emisiones de programas en UHF o VHF o transmisiones vía cable dirigidas al público en general puede requerir la autorización de la compañía de emisión por cable y/o del propietario del programa.

Información para el propietario

Los números de serie y modelo están situados en la portada de este manual y en la parte posterior del televisor.

Marcas comerciales y derechos de autor

ENERGY STAR® es una marca registrada.

En calidad de compañía asociada a ENERGY STAR®, Sony ha determinado que este producto o modelo de producto cumple con las directrices de uso eficiente de energía de ENERGY STAR®.

WEGA , FD Trinitron, Caption Vision, Steady Sound, Intelligent Picture son marcas comerciales de Corporación Sony.

Normas importantes sobre seguridad

Para su protección, lea detenidamente estas instrucciones y guarde este manual para futuras consultas.
Lea cuidadosamente todas las advertencias y precauciones y siga las instrucciones inscritas en el televisor o descritas en el manual de instrucciones o de reparación.

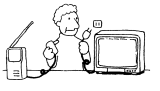
ADVERTENCIA

Para protegerse contra daños personales, siga las precauciones de seguridad básicas durante la instalación, la utilización y el mantenimiento del televisor indicadas a continuación.

USO

Fuentes de alimentación

Este televisor solamente deberá alimentarse con el tipo de fuente de alimentación indicado en la etiqueta de serie/modelo. Si no está seguro sobre el tipo de red eléctrica de su hogar, consulte a su proveedor o a la compañía de suministro eléctrico local. En caso de un televisor diseñado para alimentarse con baterías, consulte su manual de instrucciones.



Conexión a tierra o polarización

Este aparato cuenta con cable eléctrico con clavija polarizada (con una terminal más ancha que la otra), o con tres terminales (la tercera es para la conexión). Siga las instrucciones indicadas a continuación:

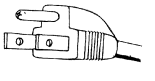
Para los equipos con un enchufe de cable de alimentación de ca polarizado

El enchufe se introduce en la toma de corriente en una única dirección. Se trata de una característica de seguridad. Si no puede insertar completamente el enchufe en la toma, intente girar el enchufe. Si sigue teniendo problemas para insertar el enchufe, póngase en contacto con su electricista para que le instale una toma adecuada. No ponga a prueba la finalidad de seguridad del enchufe polarizado forzándolo.

Advertencia alternativa

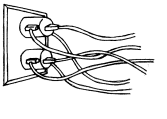
Para los equipos con un enchufe de ca con tres cables de conexión de tierra

Este enchufe únicamente se acoplará a una toma de corriente de conexión a tierra. Se trata de una característica de seguridad. Si no puede insertar el enchufe en la toma, póngase en contacto con su electricista para que le instale una toma adecuada. No ponga a prueba la seguridad del enchufe de conexión a tierra.



Sobrecarga

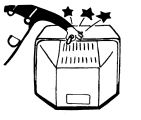
No sobrecargue las tomas de pared, los cables de extensión ni los receptáculos más allá de su capacidad, puesto que podría producirse un incendio o una descarga eléctrica. Apague siempre el aparato cuando no lo utilice. Si no va a utilizar el aparato durante un tiempo prolongado, desconéctelo de la toma de pared como precaución ante la posibilidad de que se produzca un mal funcionamiento interno que pueda provocar un incendio.



No desconecte la antena ni el cable de alimentación en caso de tormenta. Los relámpagos podrían descargar mientras sujeta el cable y provocarle lesiones graves. Apague el televisor y espere que el tiempo mejore.

Introducción de objetos y líquidos

No introduzca objetos de ningún tipo a través de las ranuras del gabinete, ya que podrían tocar puntos de tensión peligrosa o provocar cortocircuitos de piezas, lo que podría resultar en incendios o descargas eléctricas. No derrame nunca ningún tipo de líquido sobre el televisor.



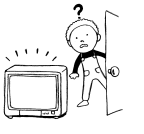
Accesorios

No utilice ningún accesorio no recomendado por el fabricante, ya que podría ser peligroso.
No coloque ningún tipo de objetos, especialmente objetos pesados, encima del aparato. Podrían caerse del aparato y causar lesiones.

Limpieza

Antes de limpiar el televisor, desconéctelo de la alimentación. No utilice limpiadores líquidos ni aerosoles. Para limpiar el exterior del televisor, emplee un paño ligeramente humedecido en agua.

Si se produce un ruido continuo o intermitente en el interior del aparato de televisión mientras está en funcionamiento, desconecte el televisor y póngase en contacto con el proveedor o con el servicio de asistencia técnica. Es normal que algunos aparatos de televisión produzcan ocasionalmente este tipo de ruidos, especialmente cuando se conectan y desconectan.



Instalación

Para levantar o mover el aparato siempre se deberá hacer entre dos o más personas. El aparato es pesado y la superficie inferior es plana. Si intenta mover el aparato sin ayuda o lo manipula de forma insegura, puede producirse lesiones graves. Instale el aparato sobre una superficie plana y estable.

Agua y humedad

No utilice aparatos de alimentación eléctrica cerca del agua — por ejemplo, cerca de una bañera, un lavabo, un fregadero o una lavadora, en un sótano húmedo, ni cerca de una piscina, etc.

Colocación

No coloque el televisor sobre una mesita con ruedas, un pedestal, una mesa o un estante inestable. El televisor podría caer, causando daños serios a niños, adultos y al propio televisor. Utilice solamente la mesita de ruedas o soporte recomendado por el fabricante para el modelo específico. La combinación de un televisor y un mueble con ruedas deberá moverse con cuidado. Las paradas bruscas, la fuerza excesiva y las superficies desiguales pueden hacer que el aparato y el mueble volqueen.

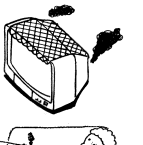
Desconecte todos los cables del aparato antes de intentar moverlo.

No permita que niños o animales se suban encima del aparato o lo empujen. El aparato podría caerse y causar lesiones graves.

Ventilación

Las ranuras y aberturas en la parte posterior o inferior del televisor son para permitir la ventilación necesaria. Para asegurar la operación fiable del televisor y protegerlo contra el sobrecalentamiento, estas ranuras y aberturas no deberán cubrirse ni bloquearse nunca.

- ❑ No tape las ranuras ni aberturas con paños ni otros materiales.



- ❑ No bloquee las ranuras ni aberturas colocando el televisor sobre una cama, sofá, alfombra u otras superficies similares.

❑ No coloque el televisor en un lugar cerrado, como en un librero o un mueble empotrado, a menos que esté adecuadamente ventilado.

❑ No coloque el televisor cerca, ni sobre un radiador o una salida de aire caliente, ni expuesto a la luz solar directa.

Protección del cable de alimentación

No permita que ningún objeto quede sobre el cable de alimentación, ni coloque el televisor donde el cable pueda quedar sometido a desgaste o presión.

Conexión a tierra o polarización

Este aparato puede estar equipado con un enchufe de línea de corriente alterna polarizado (con una terminal más ancha que la otra). El enchufe sólo se puede introducir en la toma de corriente en una dirección. Se trata de una característica de seguridad. Si no puede insertar completamente el enchufe en la toma, intente girarlo. Si sigue teniendo problemas para introducir el enchufe, póngase en contacto con su electricista para que sustituya la toma obsoleta. No ponga a prueba la seguridad del enchufe polarizado.

Antenas

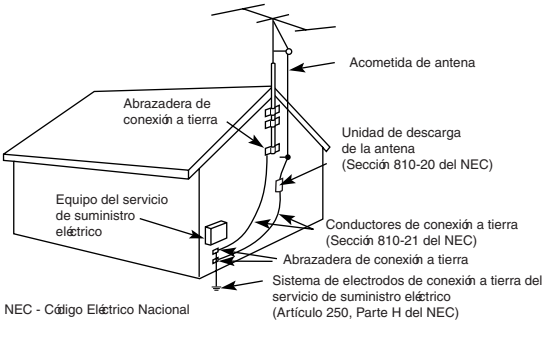
Conexión a tierra de una antena exterior

Para instalar una antena exterior, siga los procedimientos que se indican a continuación. Los sistemas de antenas exteriores no deben situarse cerca de líneas eléctricas o circuitos de alimentación o luz eléctrica, o bien donde pueda entrar en contacto con dichas líneas eléctricas o circuitos.

CUANDO INSTALE UN SISTEMA DE ANTENA EXTERIOR, EXTREME LAS PRECAUCIONES Y MANTÉNGALO ALEJADO DE DICHAS LINEAS ELECTRICAS O CIRCUITOS, DADO QUE EL CONTACTO PUEDE RESULTAR FATAL.

Asegúrese de que el sistema de antena tiene conexión a tierra para proporcionar protección contra los incrementos de voltaje y el aumento de las cargas estáticas. El apartado 810 del Código Eléctrico Nacional (NEC) en EE.UU. y el apartado 54 del Código eléctrico de Canadá proporcionan información relativa a la conexión a tierra adecuada del mástil y de la estructura de soporte, la conexión a tierra del cable de conexión a la unidad de descarga de la antena, el tamaño de los conductores de la conexión a tierra, la ubicación de la unidad de descarga de la antena, la conexión de los electrodos de conexión a tierra y los requisitos de los electrodos de conexión a tierra.

Conexión a tierra de la antena de acuerdo con el Código Eléctrico Nacional, ANSI/NFPA 70


Acometida de antena
Abrazadera de conexión a tierra
Unidad de descarga de la antena (Sección 810-20 del NEC)
Equipo del servicio de suministro eléctrico
Conductores de conexión a tierra (Sección 810-21 del NEC)
Abrazadera de conexión a tierra
Sistema de electrodos de conexión a tierra del servicio de suministro eléctrico (Artículo 250, Parte H del NEC)
NEC - Código Eléctrico Nacional

Rayos

Para mayor protección del receptor de televisión durante una tormenta con rayos o cuando no se utiliza durante largos periodos de tiempo, desconéctelo de la toma de pared y desconecte la antena. Con ello evitará que los rayos y los incrementos de voltaje dañen el receptor.

Reparación

Daños que requieren reparación

Desconecte el aparato de la toma de pared y haga que sea revisado por personal calificado cuando se produzcan las siguientes condiciones:

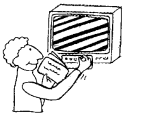
❑ Si el cable de alimentación o el enchufe están dañados o deshilachados.

❑ Si se ha vertido líquido en el interior del aparato o si se han caído objetos en el interior del producto.

❑ Si el aparato se ha expuesto a lluvia o agua.

❑ Si el aparato se ha caído y ha sufrido golpes excesivos o si se ha dañado la unidad.

❑ Si el aparato no funciona con normalidad al seguir las instrucciones del manual. Ajuste solamente los controles que se especifican en el manual de instrucciones. El ajuste inadecuado de otros controles puede provocar daños y a menudo requerirá mucho trabajo por parte de un técnico calificado para restablecer el funcionamiento normal del aparato.



❑ Si el aparato muestra un cambio de rendimiento significativo, debe repararse.

Asistencia técnica

No intente reparar por sí mismo el aparato ya que al abrir el gabinete se vería expuesto a tensiones peligrosas y otros riesgos. Solicite los servicios de personal de reparación calificado.

Piezas de reemplazo

Si necesita piezas de reemplazo, asegúrese de que el técnico certifique por escrito que ha utilizado piezas de reemplazo especificadas por el fabricante con las mismas características que las piezas originales. El uso de piezas no autorizadas puede provocar incendios, descargas eléctricas y otros peligros.

Comprobación de seguridad

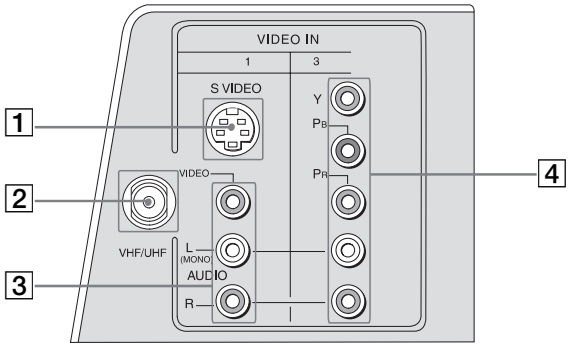
Después de realizar cualquier reparación del aparato, solicite al técnico de la reparación que realice comprobaciones rutinarias de seguridad (como especifica el fabricante) para determinar si el aparato se encuentra en condiciones seguras de funcionamiento y certificarlo. Cuando el aparato llega al final de su vida útil, debe desecharse adecuadamente para evitar una implosión del tubo de la imagen. Consulte a un técnico de reparación calificado para depositar el aparato.

Conexión del televisor

Lea este capítulo antes de instalar el televisor por primera vez. Esté capítulo hace referencia a las conexiones básicas, así como a cualquier otro equipo opcional que conecte.

Panel posterior del televisor

✍ Los páneles frontales y posteriores del televisor que se ilustran en este manual corresponden al modelo KV-25FS120.



Toma	Descripción
1 **S VIDEO**	Establece una conexión con la toma S VIDEO OUT (salida de S video) de la videograbadora o de otro equipo de video con S VIDEO. S VIDEO proporciona una mejor calidad de imagen que las tomas VHF/UHF o la toma de entrada de video. S VIDEO no proporciona sonido; los cables de audio deben estar conectados.

✍ S VIDEO proporciona una mejor calidad de imagen que las tomas VHF/UHF o la toma de entrada de video, S-VIDEO es solo para el modelo KV-25FS120.

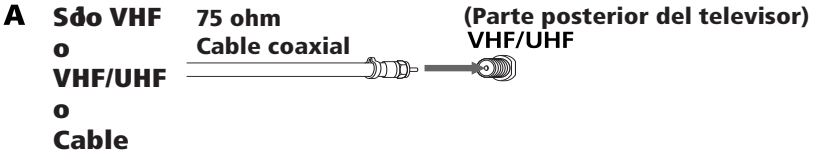
2 **VHF/UHF**	Establece una conexión con el cable o la antena de VHF/UHF.
3 **VIDEO/AUDIO L(MONO)/R**	Establece una conexión con las tomas de salida de AUDIO y VIDEO de la videograbadora o de otro equipo de video. En el panel frontal del televisor existe una segunda toma de entrada de video (VIDEO 2). Estas tomas de entrada de AUDIO/VIDEO proporcionan una mejor calidad de imagen que la toma VHF/UHF.
4 **Y, P_B, P_R/ L, R**	Se conectan con las salidas de video (Y, P_B, P_R) y de audio (L/R) de su reproductor de DVD o de su caja digital.

Conexiones básicas

Televisor con antena interior o exterior o cable CATV

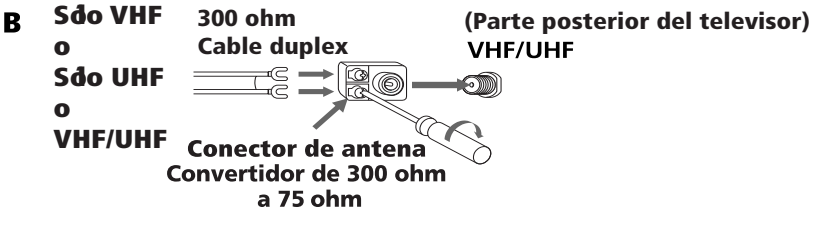
Dependiendo del cable de que disponga, elija una de las siguientes conexiones:

A



El televisor puede estar conectado ya sea al decodificador o a la antena con un cable de 75-ohm (usualmente ya instalado en casas nuevas).

B

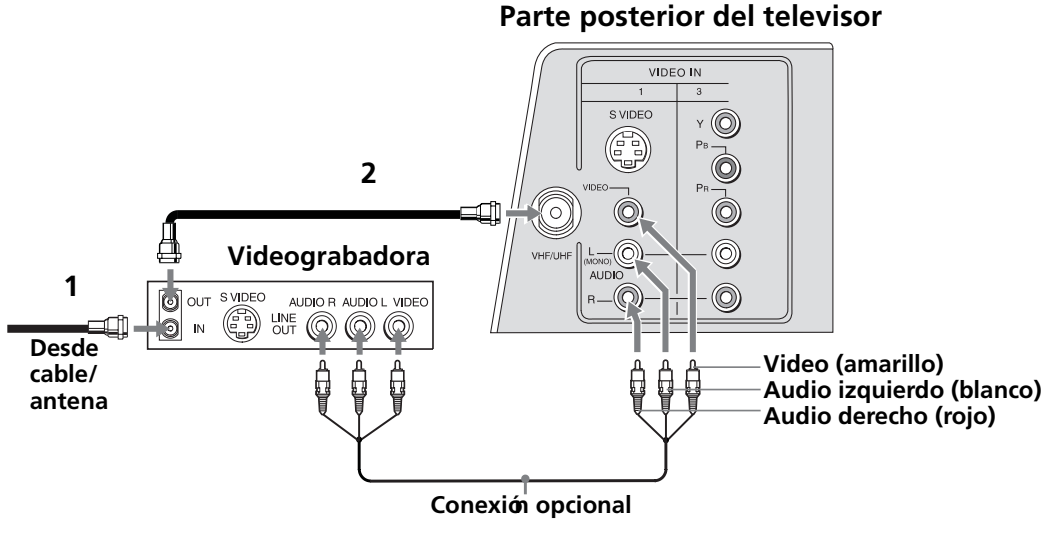


Este puede ser utilizado para conectar el televisor a una antena dipolo, también conocida como antena de conejo (usualmente encontrada en casas viejas).

✍ Si conecta el televisor a una antena interior o exterior, es posible que deba ajustar la orientación de la antena para obtener una mejor recepción.

Conexión de equipo adicional

Televisor y videograbadora



✍ Para ver programas de video desde la videograbadora, sintonice el televisor en los canales 3 ó 4 (como se indica en la parte posterior de la videograbadora).

1 Conecte el cable coaxial de la antena del televisor o del servicio de cable a la toma IN de la videograbadora.

2 Conecte el cable coaxial (no incluído) de la toma OUT de la videograbadora a la toma VHF/UHF del televisor.

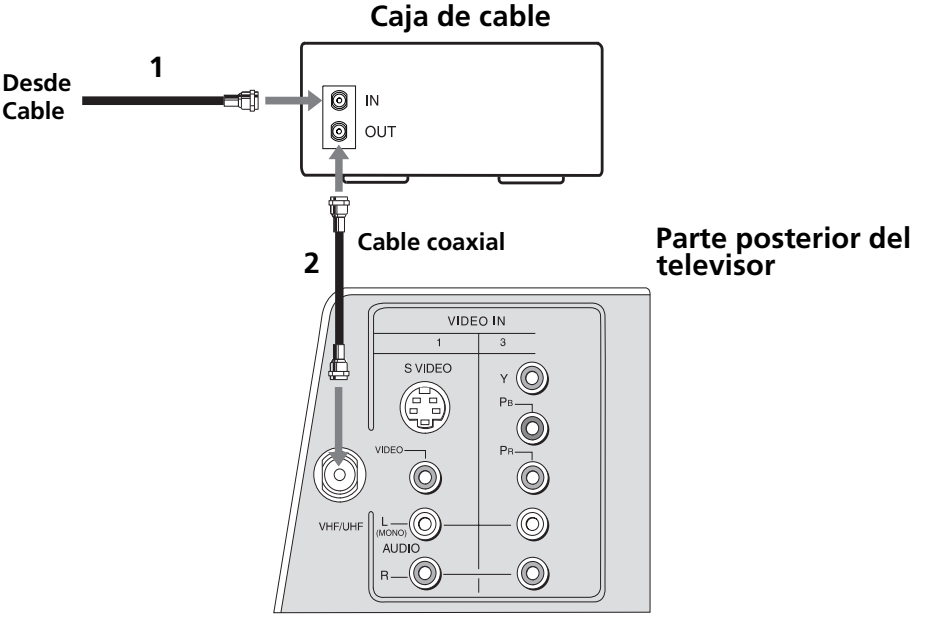
✍ Puede utilizar el botón TV/VIDEO para cambiar entre las entradas VHF/UHF y VIDEO.

Conexión opcional

- ❏ Si la videograbadora dispone de salidas de video, puede obtener una mejor calidad de imagen conectando los cables de audio/video (no incluidos) desde la salida AUDIO/VIDEO OUT de la videograbadora a la toma AUDIO/VIDEO IN del televisor.
- ❏ Para obtener una mejor calidad de imagen, utilice S VIDEO en lugar del cable amarillo de video. Como S VIDEO no proporciona sonido, debe mantener conectados los cables de audio (solo 25FS120).

✍ Receptor de satélite y el servicio de cable son sistemas de televisión de pago.

Televisor y caja de cable



1 Conecte el cable coaxial del servicio de cable a la toma IN de la caja de cable.

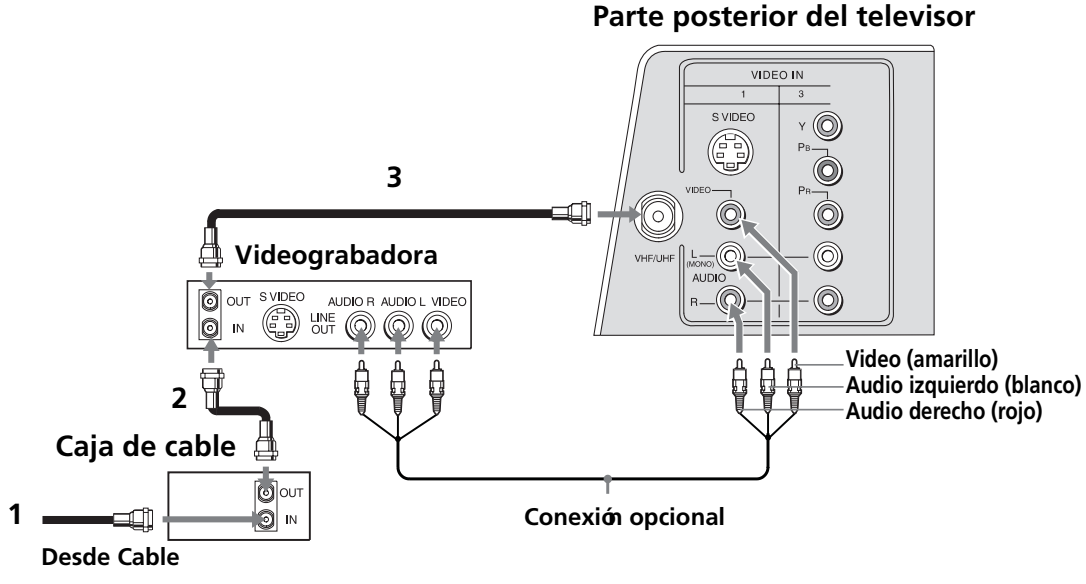
2 Conecte un cable coaxial (no incluído) de la toma OUT de la caja de cable a la toma VHF/UHF del televisor.

Conexión opcional

- ❏ Para ver los canales desde la caja de cable, sintonice el televisor en los canales 3 ó 4 (como se indica en el panel posterior de la caja de cable) y utilice el control remoto de la caja de cable para cambiar los canales.
- ❏ Si desea controlar la selección de todos los canales a través de la caja de cable, es aconsejable utilizar la función Fijar Canal ajustando el televisor en el canal 3 ó 4 (consulte la página 23).

✍ Receptor de satélite y el servicio de cable son sistemas de televisión de pago.

Televisor, videograbadora y caja de cable



1 Conecte el cable coaxial del servicio de cable a la toma IN de la caja de cable.

2 Conecte un cable coaxial (no incluído) desde la toma OUT de la caja de cable a la toma IN de la videograbadora.

3 Conecte un cable coaxial (no incluído) desde la toma OUT de la videograbadora a la toma VHF/UHF del televisor.

✍ Si desea controlar la selección de todos los canales a través de la caja de cable, es aconsejable utilizar la función Fijar Canal ajustando el televisor en el canal 3 ó 4 (consulte la página 23).

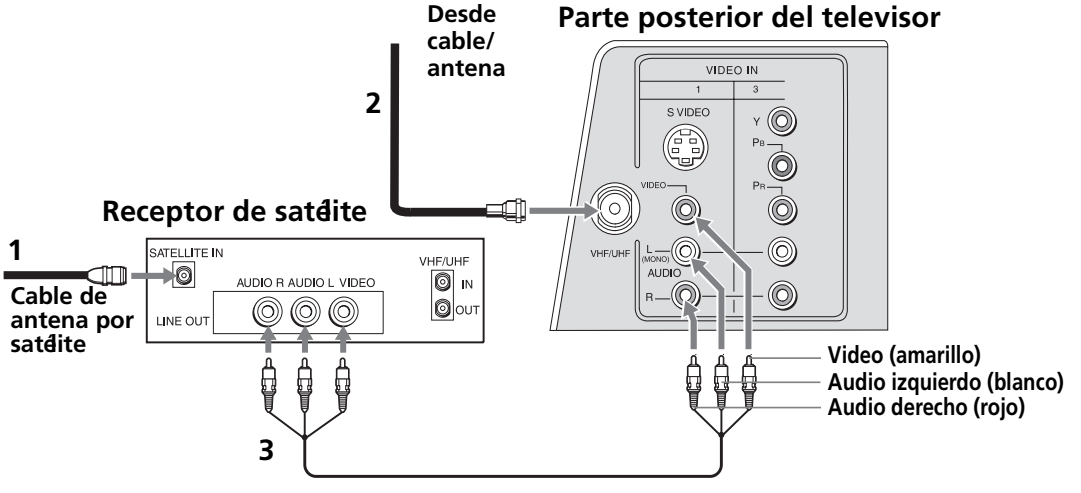
Conexión opcional

- ❏ Si la videograbadora dispone de salidas de video, podrá obtener una mejor calidad de imagen conectando los cables de Audio/Video (no incluídos) desde la salida AUDIO y VIDEO OUT de la videograbadora a la toma de entrada AUDIO/VIDEO IN del televisor.
- ❏ Para obtener una mejor calidad de imagen, utilice S VIDEO en lugar del cable amarillo de audio/video. S VIDEO no proporciona sonido; los cables de audio deben permanecer conectados para obtener sonido.

✍ Puede utilizar el botón TV/VIDEO para cambiar las entradas VHF/UHF y VIDEO.

✍ Receptor de satélite y el servicio de cable son sistemas de televisión de pago.

Televisor y receptor de satélite



1 Conecte el cable de la antena por satélite a la entrada SATELLITE IN del receptor de satélite.

2 Conecte el cable coaxial del servicio de cable o antena a la toma VHF/UHF del televisor.

3 Utilizar cables de Audio/Video (no incluídos), conecte AUDIO y VIDEO OUT del receptor de satélite a AUDIO y VIDEO IN del televisor.

✍ Para ver programas con el receptor de satélite, sintonice el televisor en el canal 3 o 4.

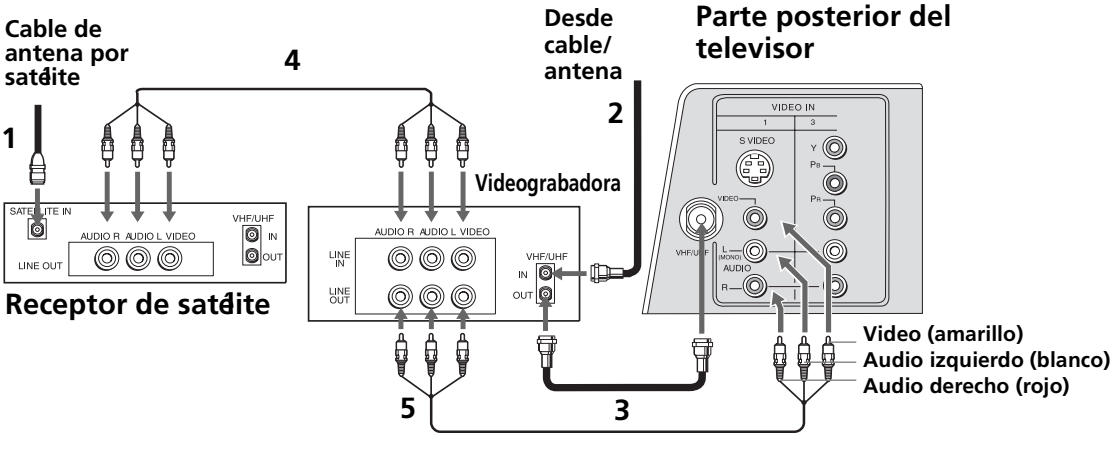
✍ Puede utilizar el botón TV/VIDEO para cambiar las entradas VHF/UHF y VIDEO.

Conexión opcional

❑ Para obtener una mejor calidad de imagen, utilice S VIDEO en lugar del cable amarillo de audio/video. S VIDEO no proporciona sonido; los cables de audio deben permanecer conectados para obtener sonido.

✍ Receptor de satélite y el servicio de cable son sistemas de televisión de pago.

Televisor, receptor de satélite y videograbadora



1 Conecte el cable de la antena por satélite a la entrada SATELLITE IN del receptor de satélite.

2 Conecte el cable coaxial del servicio de cable o antena a la toma IN de la videograbadora.

3 Conecte la toma OUT de la videograbadora a la toma VHF/UHF del televisor mediante un cable coaxial (no incluído).

4 Conecte las tomas AUDIO y VIDEO OUT del receptor de satélite a las tomas AUDIO y VIDEO IN de la videograbadora mediante los cables de Audio/Video (no incluídos).

5 Conecte las tomas AUDIO y VIDEO OUT de la videograbadora a las tomas AUDIO y VIDEO IN del televisor mediante los cables de Audio/Video (no incluídos).

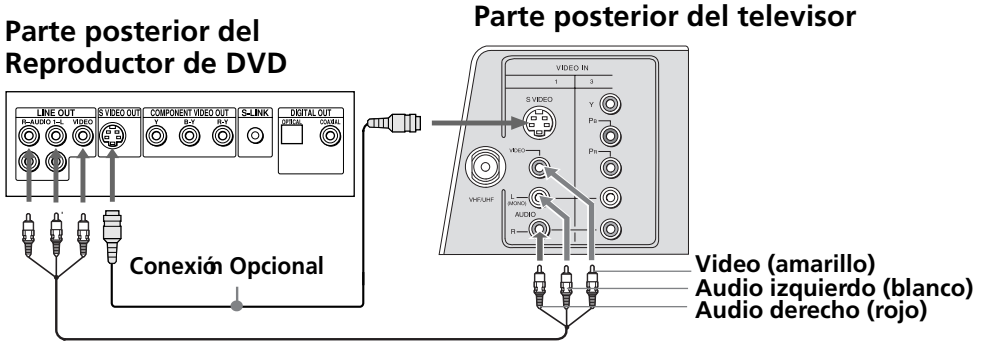
Conexión opcional

❏ Para visualizar las imágenes desde el receptor del satélite o la videograbadora, seleccione la entrada de video a la que está conectado el receptor de satélite o la videograbadora oprimiendo TV/VIDEO en el control remoto.

✍ Receptor de satélite y el servicio de cable son sistemas de televisión de pago.

Conexión de un reproductor de DVD usando video compuesto (VIDEO/AUDIO L(MONO), R)

Conecte las salidas AUDIO y VIDEO OUT del reproductor de DVD a las entradas AUDIO y VIDEO IN del televisor mediante los cables de AUDIO / VIDEO (no incluidos).

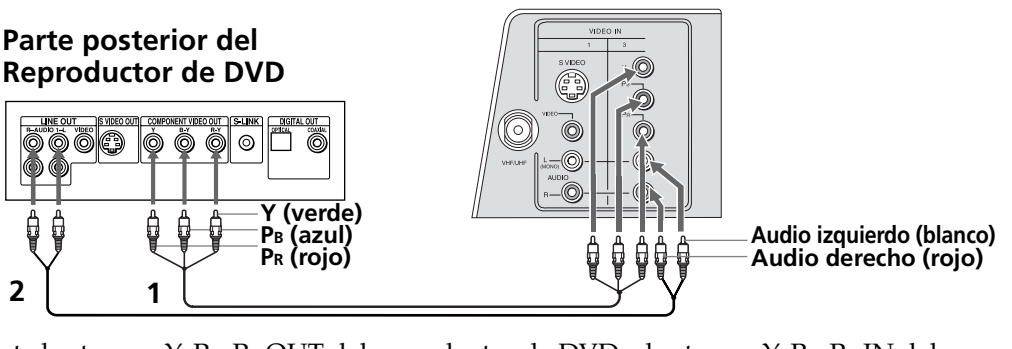


Conexión opcional

- ❏ Para obtener una mejor calidad de imagen, utilice S VIDEO en lugar del cable amarillo de AUDIO/VIDEO S VIDEO no proporciona sonido; los cables de audio deben permanecer conectados para obtener sonido.

Conexión de un reproductor de DVD usando video componenete (Y, P_B, P_R/L, R)

- ❏ Si el reproductor de DVD dispone de salidas de video para componentes (Y, P_B, P_R), podrá optimizar la calidad de imagen utilizando cables de video para componentes.



1 Conecte las tomas Y, P_B, P_R OUT del reproductor de DVD a las tomas Y, P_B, P_R IN del televisor mediante los cables de video para componentes.

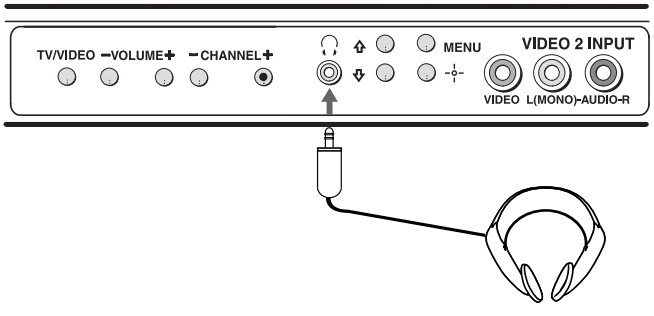
2 Conecte la toma AUDIO OUT del reproductor de DVD a la toma AUDIO IN del televisor.

✍ Las salidas Y, P_B, P_R del reproductor de DVD algunas veces están etiquetadas como Y, P_B y P_R o Y, P_B-Y, y P_R-Y. Si es así, conecte los cables según el color de las tomas.

Conexión de audífonos

Conecte los audífonos a la toma ⎍ situada en la parte frontal del televisor.

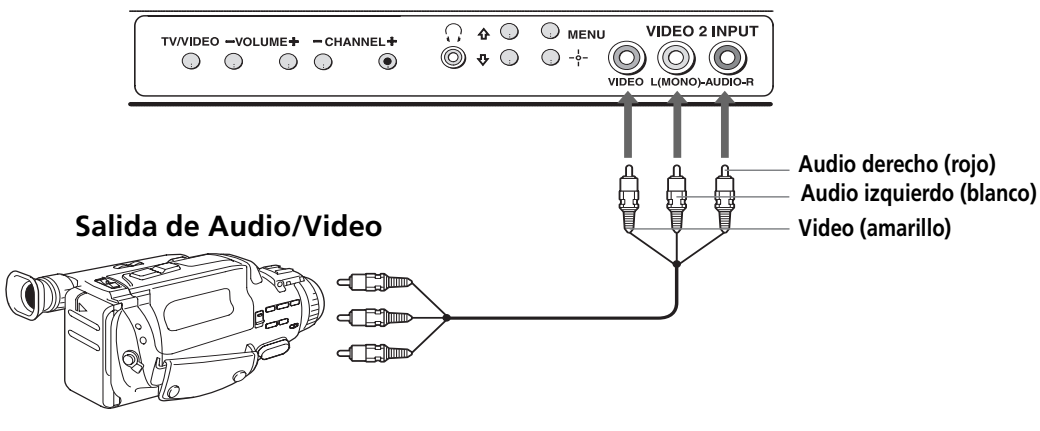
Panel de Audio/Video frontal



Conexión de una cámara de video

Conecte las salidas AUDIO y VIDEO OUT de la cámara de video a las entradas AUDIO y VIDEO INPUT del televisor mediante los cables de Audio/Video (no incluídos).

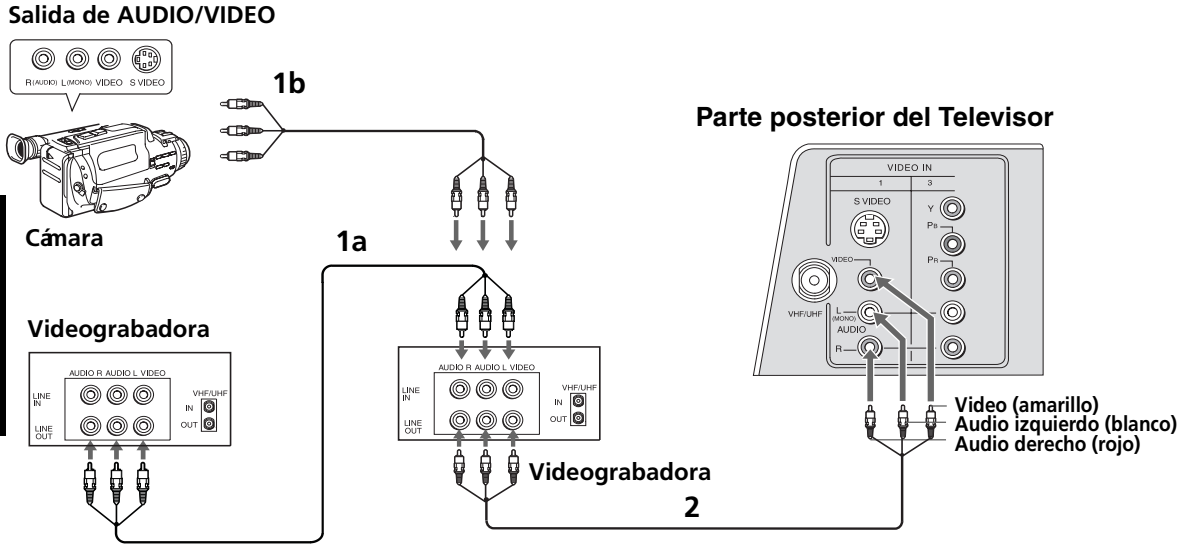
Panel de Audio/Video frontal



Conexión opcional

- ❏ Para obtener una mejor calidad de imagen, use S VIDEO en lugar del cable amarillo de video. Como S VIDEO no proporciona sonido, debe mantener conectados los cables de audio.

Conexión para editar Videocintas (videograbadora y cámara de video)



1 Para editar una videocinta conecte a la videograbadora las siguientes aparatos (videograbadora o camara de video).

- **a)** Con un cable de audio/video (no incluido) conecte AUDIO/VIDEO OUT de la videograbadora (para reproducir) al AUDIO/VIDEO IN de su videograbadora (para grabar).
- **b)** Con un cable de audio/video (no incluido) conecte AUDIO/VIDEO OUT de su cámara de video al AUDIO/VIDEO IN de su videograbadora (para grabar).

2 Con un cable de audio/video (no incluido) conecte AUDIO/VIDEO OUT de su videograbadora (para grabar) al AUDIO/VIDEO IN de su televisor.

3 Con un cable de audio/video (no incluido) conecte AUDIO/VIDEO OUT de su videograbadora (para grabar) al AUDIO/VIDEO IN de su televisor.

Información Adicional

Solución de problemas

Si tiene problemas con el televisor, intente seguir las indicaciones que se sugieren a continuación. Si el problema persiste, consulte con su proveedor Sony más cercano.

General

Problema	Posibles Soluciones
Hace falta restablecer los ajustes de fábrica	❑ Encienda el televisor, mientras mantenga oprimido el botón RESET del control remoto, oprima el botón de POWER (encendido/apagado) del panel frontal del televisor. (El televisor se apagara). Suelte el botón RESET. Encienda el televisor.
Aparece un cuadro negro en la pantalla	❑ Está seleccionada una opción de texto en el menú de Ajustes (página 27) y no hay texto disponible. Para desactivar esta función, seleccione No en la opción Caption Vision (subtítulos). Si desea ver subtítulos, escoja CC1-4 en lugar de Text1-4.

Control Remoto

El Control Remoto no funciona	❑ Al operar su televisor oprima TV (FUNCTION). ❑ Vea si coloco las baterías correctamente. ❑ Las baterías pueden estar bajas. Sustitúyalas (página 2). ❑ Aleje el televisor a 1 metro aproximadamente de cualquier lámpara fluorescente.
No se puede cambiar el canal con el control remoto	❑ Asegúrese de que no ha cambiado el televisor del canal 3 o 4 con otro dispositivo para cambiar canales.
Perdió el control remoto	❑ Puede utilizar los botones del panel frontal de audio y video para acceder a los menús (página 2). Póngase en contacto con su proveedor Sony mas cercano para solicitar uno de repuesto.

Video

No hay imagen ni sonido	❑ Asegúrese de que el cable de alimentación esté conectado ❑ Si hay luz roja que parpadea en la parte frontal del televisor durante unos minutos, desconecte y vuelva a conectar el cable de alimentación para restaurar el televisor. Si el problema persiste llame al servicio técnico local. ❑ Compruebe los ajuste de TV/VIDEO; si ve la televisión, póngalo en TV; si ve imágenes de un aparato de video, póngalo en VIDEO 1,2,3 o 4 (página 3). ❑ Intente ver otro canal para descartar algún problema en la emisora.
Imagen de mala calidad, sin imagen, buen sonido	❑ Ajuste el contraste en el menú de Video (página 20). ❑ Ajuste el brillo en el menú de Video (página 20). ❑ Compruebe las conexiones de la antena o del cable (página 6).

Imagen pobre en color y nitidez	❏ Ajuste color en el menú de video (página 20). ❏ Ajuste nitidez en el menú de video (página 20). ❏ Asegúrese en el menú de video que la opción de "Intelligent Pic" se encuentre en la posición de "No" (página 21).
Sin color	❏ Ajuste Color en el menú de Video (página 20).
Sin señal	❏ Compruebe el ajuste de Cable en el menú de Canal (página 23). ❏ Compruebe las conexiones de la antena o del cable (página 6). ❏ Asegúrese de que el canal seleccionado esté emitiendo señal.
Líneas de puntos o rayas	❏ Ajuste la antena. ❏ Aparte el televisor de cualquier otro equipo electrónico. Algunos equipos electrónicos crean ruido eléctrico que puede interferir con la recepción del televisor.
Imágenes dobles o fantasmas	❏ Revise la antena exterior a llame al servicio técnico de cable.

Audio

Buena imagen, sin sonido	❏ Presione MUTING para que desaparezca Muting de la pantalla (página 3) ❏ Compruebe los ajustes de Audio. Es posible que el televisor esté ajustado en Auto SAP o se encuentre en la posición No (página 22).

Canales

No se reciben canales con un número alto (UHF) cuando se utiliza una antena	❏ Asegúrese de que Cable esté en la posición NO en el menú de Canal (página 23). ❏ Ejecute autoprogramación para añadir canales que actualmente no estén en la memoria (página 15).
Parece que no funcionan las emisoras de cable	❏ Asegúrese de que Cable esté en la posición Si en el menú de Canal (página 23). ❏ Ejecute Auto programación para añadir canales que actualmente no estén en la memoria (página 15).
Sólo se puede sintonizar la señal de televisión en la ventanilla	❏ Asegúrese de que no configuró la etiqueta de video en el menú de Ajustes (página 27) para omitir sus entradas de video.

Si después de leer este manual de instrucciones, tiene más preguntas relacionadas con el uso del televisor Sony, póngase en contacto con su proveedor Sony más cercano para recibir asistencia técnica.